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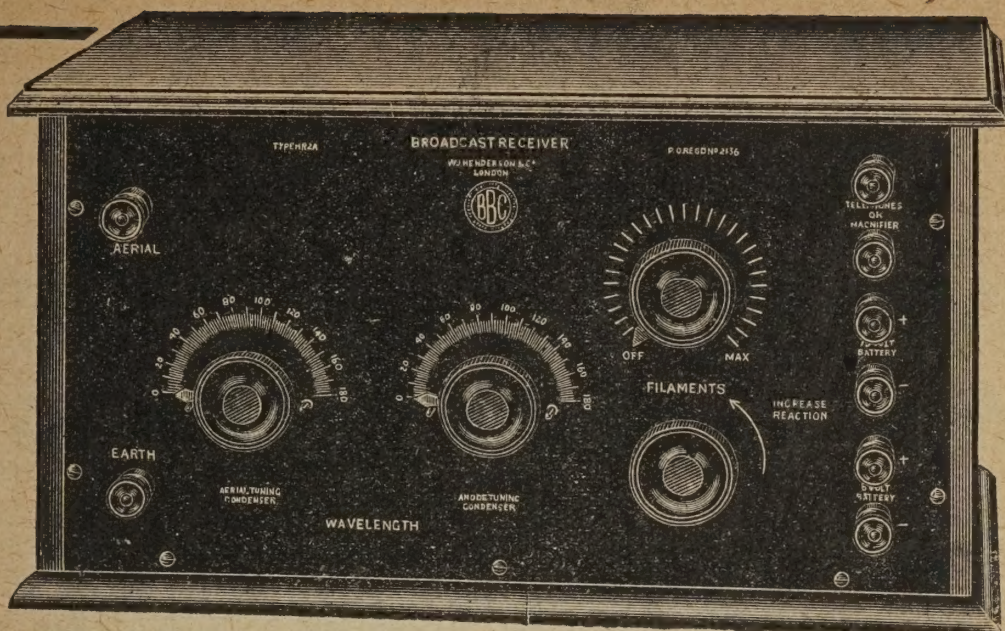
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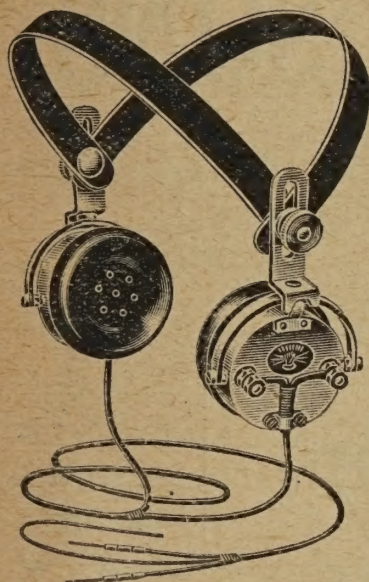
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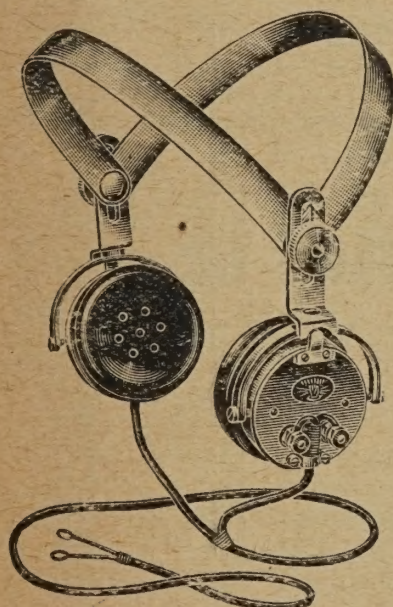
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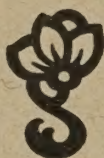
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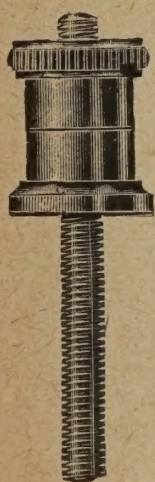
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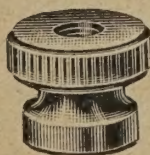
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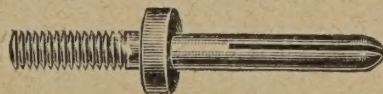
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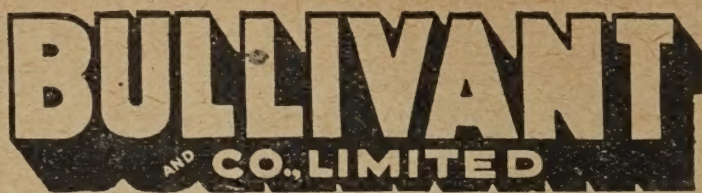


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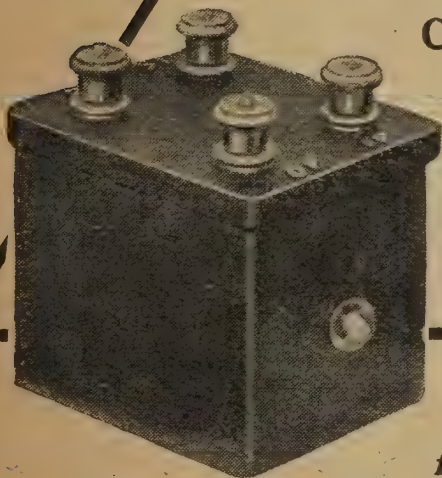
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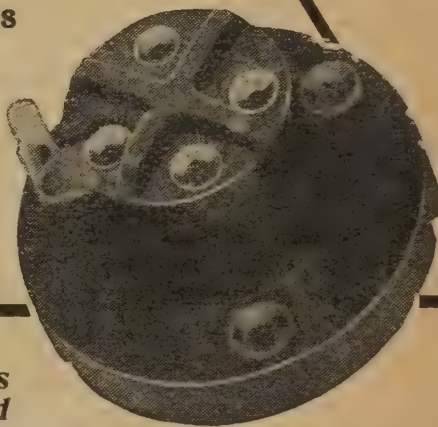
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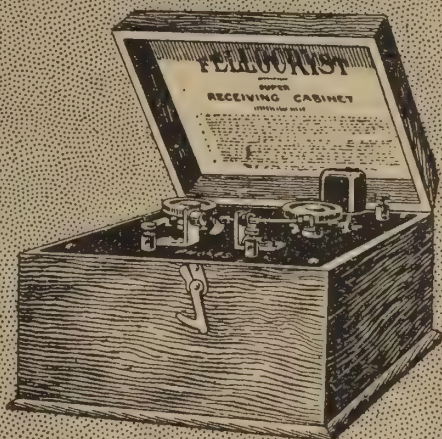
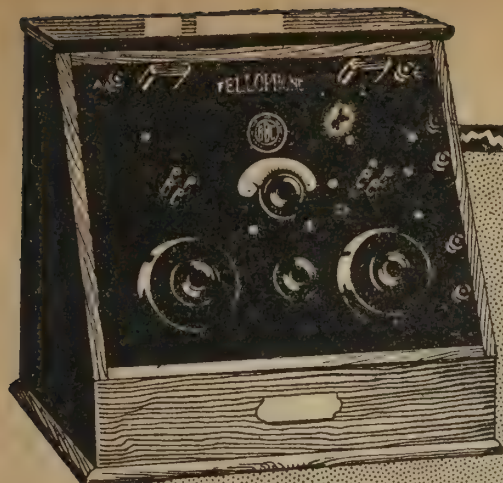
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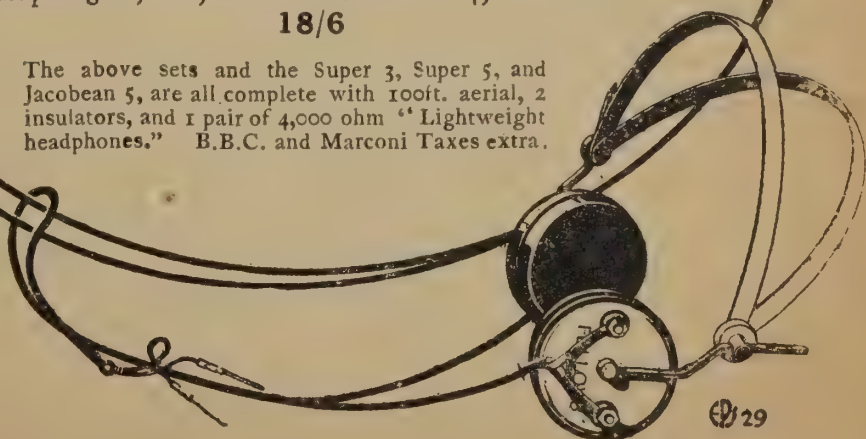
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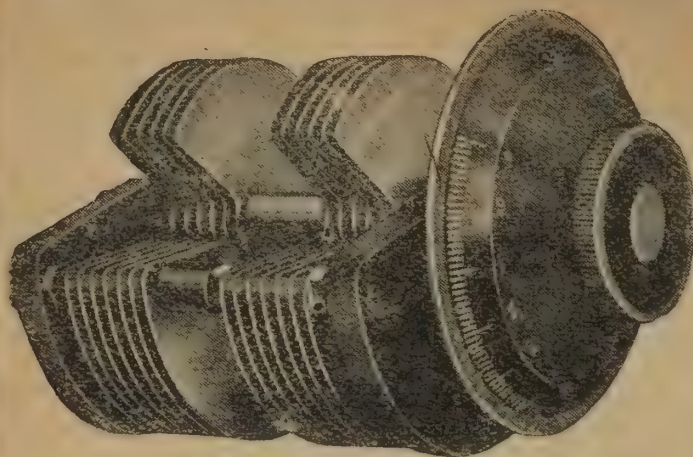
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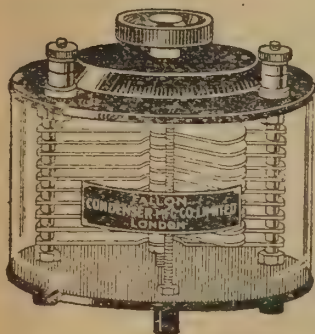
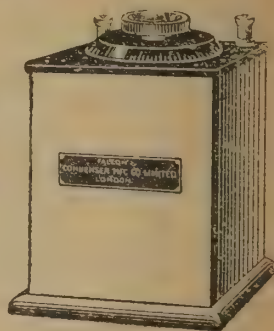
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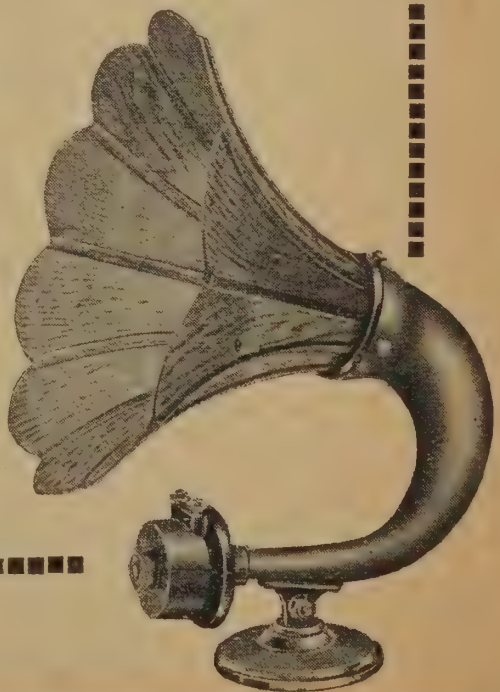
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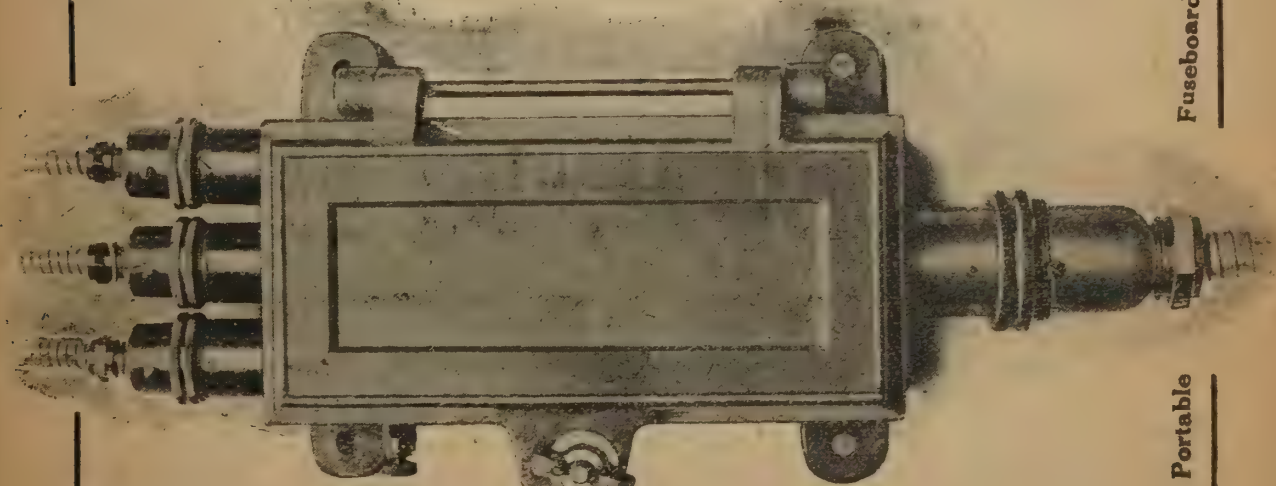
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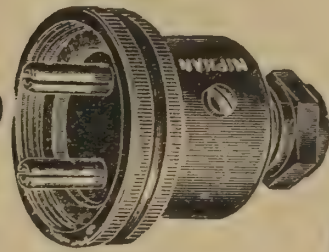
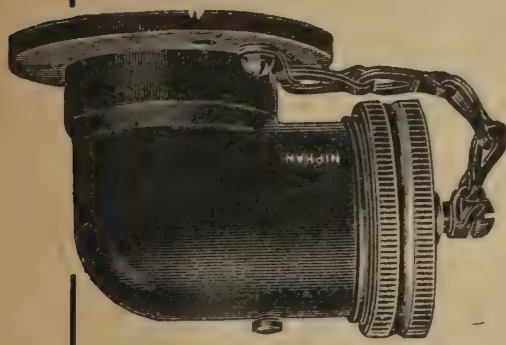
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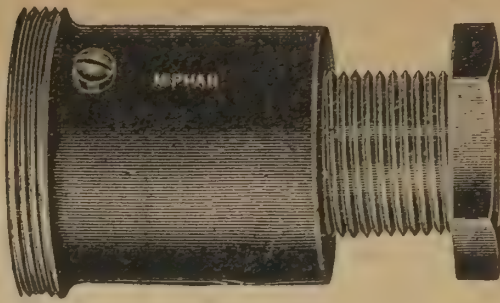
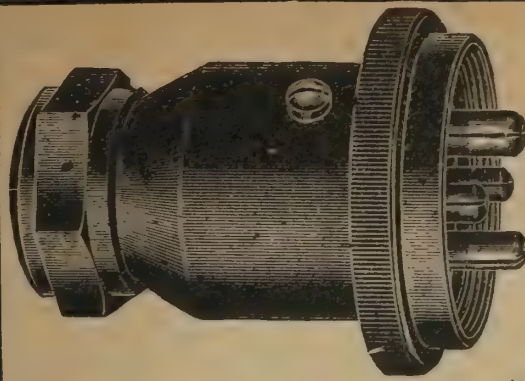


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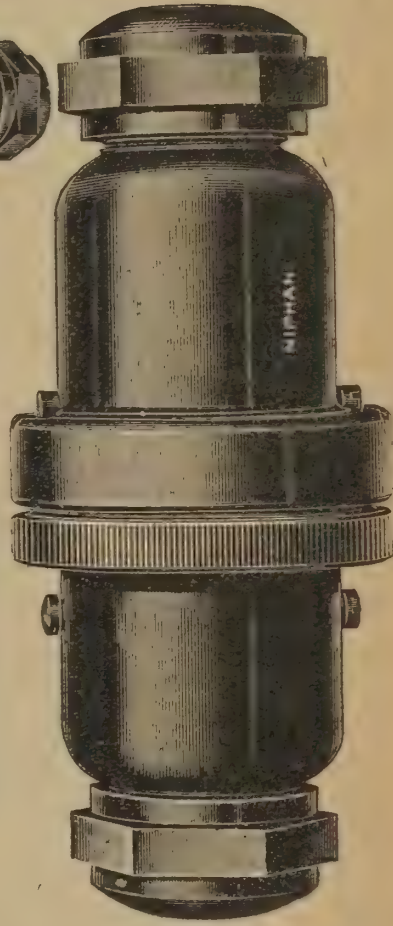
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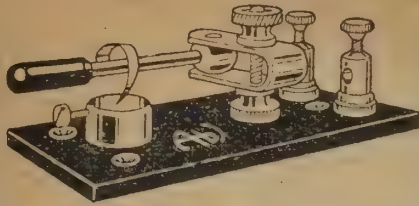
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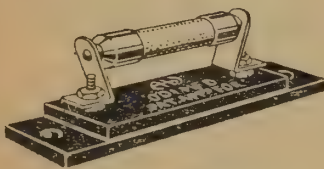


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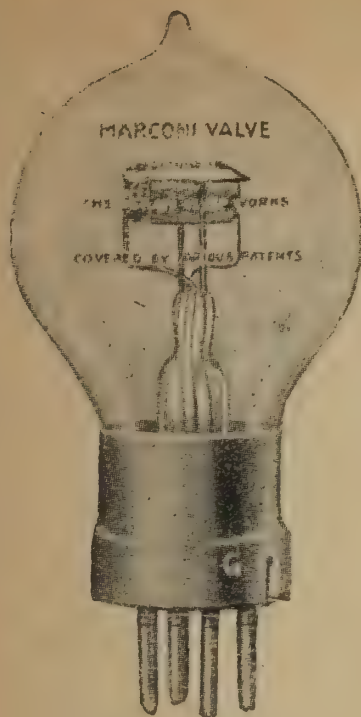
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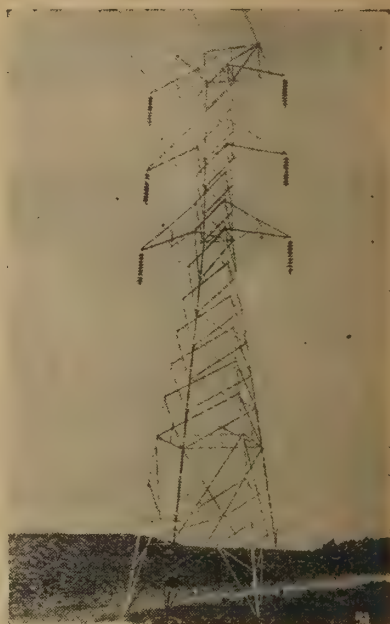
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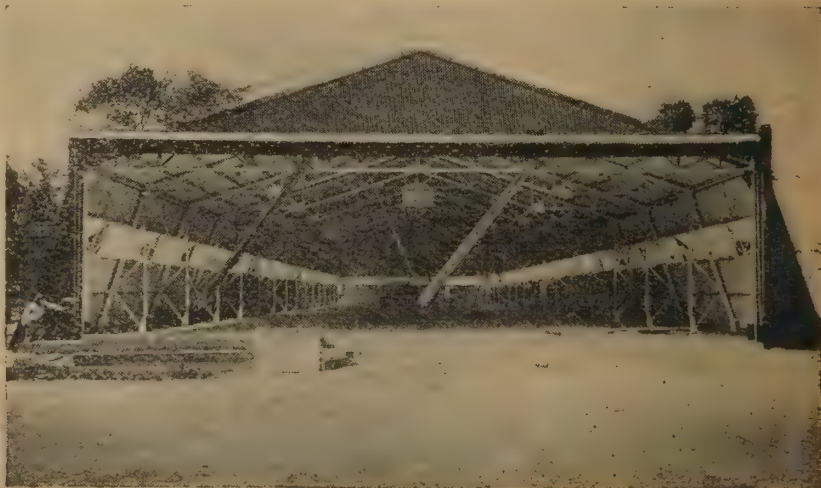
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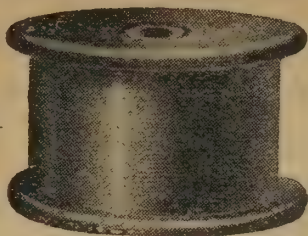
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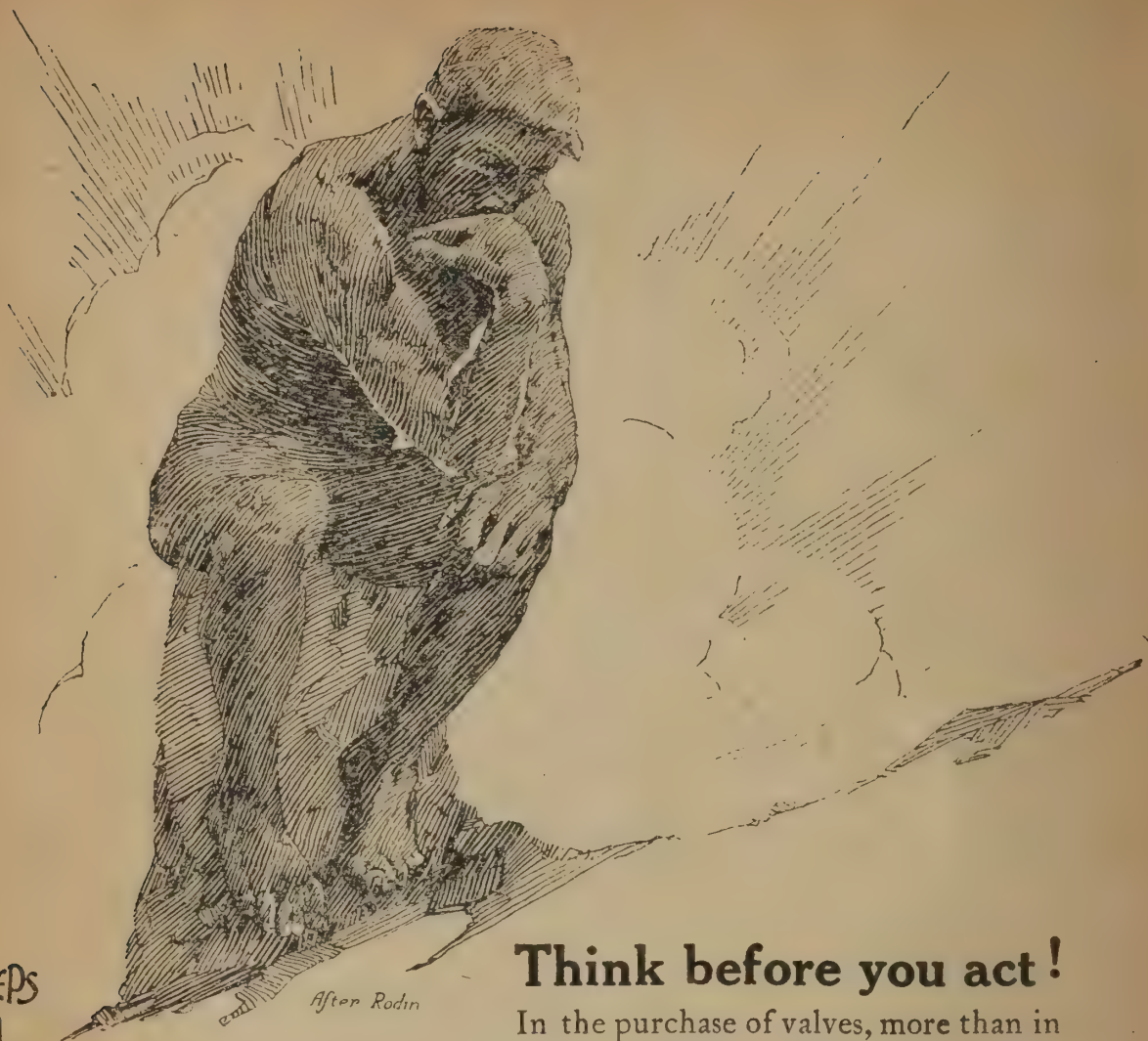
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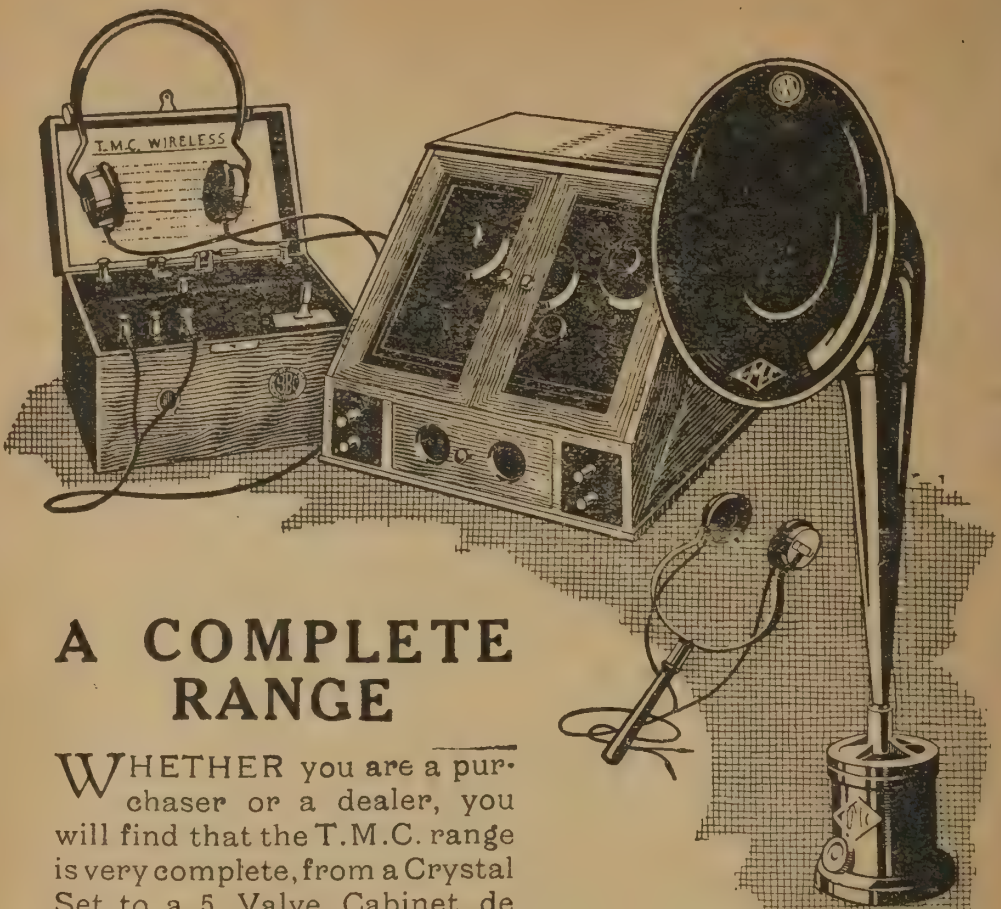
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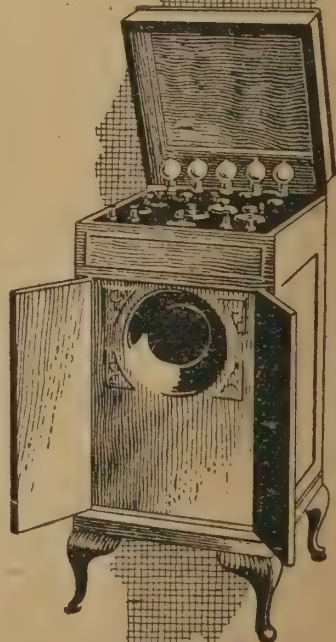
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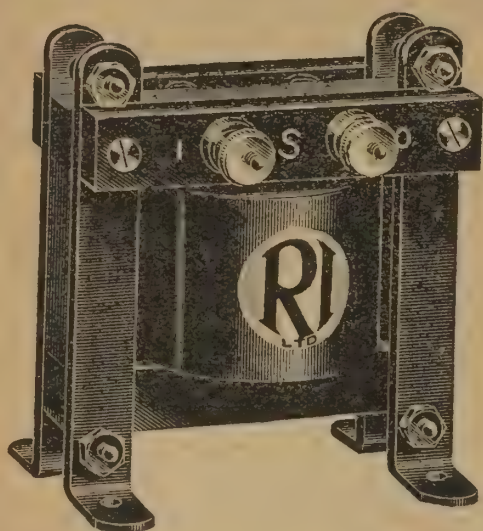
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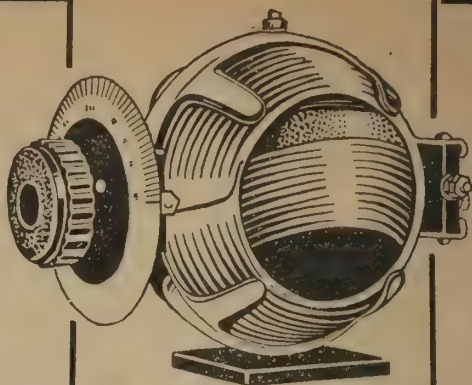
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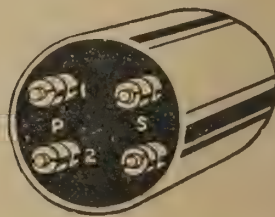
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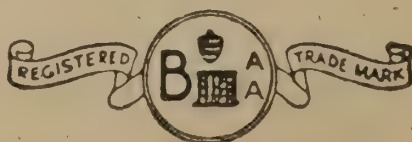
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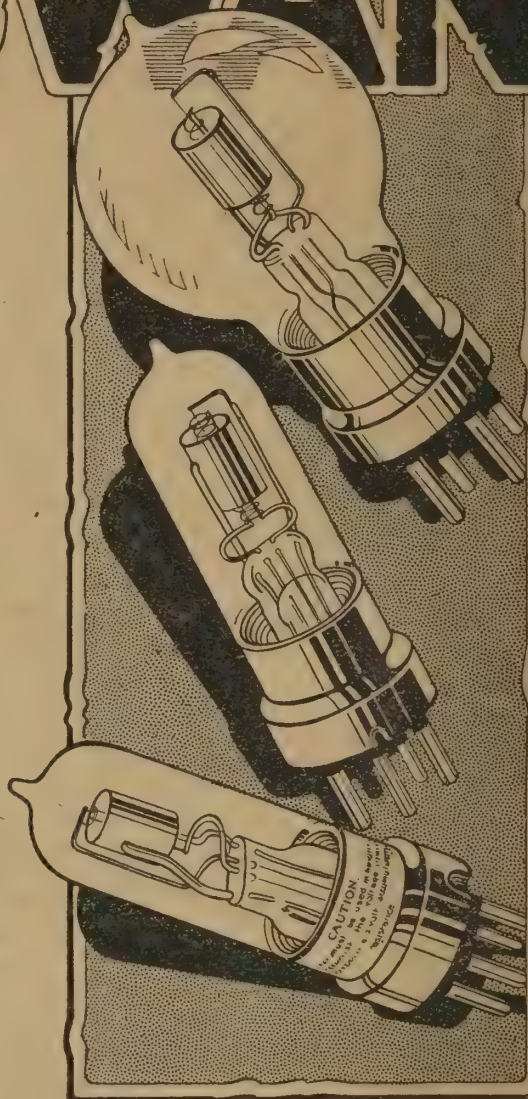
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PREFACE

IN compiling the present edition of the Year Book, we have endeavoured to retain all the essential features of former editions and at the same time to keep the book within reasonable limits. It was felt that, with each succeeding edition, the Year Book grew more bulky until it had attained unwieldy dimensions. It was decided to omit the list of Ship Stations, because every British vessel equipped with wireless telegraphy is bound by the Post Office regulations to carry the official "Berne List." The historical and geographical information has also been cut out of the introductory remarks to the Laws and Regulations governing the use of wireless in the various countries of the world.

One of the main difficulties in compiling a publication of this nature is to be consistent. The information received is so varied and comes from so many different sources and at different times during the year, that it is practically impossible to avoid slight discrepancies which the hypercritical are usually eager to discover. We may at once forestall one criticism by stating that we are aware that Uruguay and the United States are not in their correct alphabetical order in the "Laws and Regulations" section; this oversight was mainly due to the fact that papers relating to the United States were filed under "U.S.A."

We have endeavoured to make the information contained in these pages as complete and up-to-date as possible, having regard to the space available. The list of Land Stations has been corrected up to December 31st. The opening of new stations and the alteration in wavelengths entails perpetual amendments to our records. The stations belonging to that restless nation, the United States, are constantly changing their wavelengths, sometimes only to an infinitesimal degree—*e.g.*, S. Diego whose wavelength was altered from 9800 to 9801 metres—existing stations close down and re-open in a most confusing manner, and altogether it is a difficult matter to keep the lists up to date.

We have to express our thanks to M. Etienne and the staff of the Berne International Bureau for the courteous assistance they have given us, and to the Intelligence Department at Marconi House who have enabled us to supplement the official information received from Berne.

The maps, which formed a special feature of last year's edition, have been carefully revised and corrected. The hypercritical may again discover that some few stations enumerated in the list of Land Stations are not found on the maps, the reason being that the latter were finished at an earlier date than the letterpress and consequently it was not practicable to include all the newest stations. We would also state that, owing to a misunderstanding, the Portuguese Naval Station at Monsanto, Lisbon, (which is not included in the official "Berne List") appears in Map 10 as though it were located at the better-known Monsanto near the borderland between Portugal and Spain.

The Record of Development has been carefully compiled by Mr. W. H. Nottage. This subject is now so world-wide that we have abandoned the practice hitherto adopted of considering the progress of wireless in individual countries.

PREFACE

With regard to the Laws and Regulations, we wish to acknowledge most gratefully the very valuable assistance given by the Postal Authorities, Consular Offices and other foreign and colonial officials in furnishing us with information concerning their land stations and the laws and regulations governing the use of wireless. In many cases the information supplied is too extensive for publication in full, but is none the less valuable, as it enables us to deal with many of the puzzling questions we are often asked regarding wireless in foreign countries.

Mr. W. G. W. Mitchell has expended much time and care in the preparation of the Scientific Signal Section and he joins us in his thanks to the various controllers of meteorological departments and observatories who have so readily supplied us with particulars concerning the transmission of weather reports, time signals and meteorological information.

The Direction Finding Section has again been ably compiled by Mr. R. L. Smith-Rose and the Aviation Section by Mr. Duncan Sinclair, whose introduction relating to the progress of Radiotelegraphy on Commercial Aircraft affords very interesting reading.

With regard to the Biographical Section, it has been found impossible to include the whole army of wireless experts, and we have reluctantly been compelled to omit the names of some of those whose biographical notices were published in previous editions.

The contributors of the articles specially written for this publication include Mr. E. V. Appleton, of St. John's College, Cambridge, the well-known writer on radiotelegraphic subjects; Capt. C. F. Trippe, the recognised authority on valves; Mr. Robert Donald who, in addition to his manifold interests in wireless matters, has recently been appointed chairman of the Committee to consider the policy to be adopted regarding Imperial wireless services; Comm. J. A. Slee and Mr. R. Keen, both of whom can write with authority on their respective subjects. To all these contributors we offer our sincere gratitude.

Finally the Editor wishes to express his personal thanks to the printers for their co-operation in the preparation of this volume. It is perhaps as unusual publicly to thank one's printer as it is to thank an accompanist after a concert, yet the relations between editor and printer are very similar to those existing between a singer and his accompanist. The best song may well be ruined by a bad accompaniment and, conversely, a good accompanist can often conceal some of the defects of a bad performer. A mutual understanding and collaboration between the two is essential, and if the singer—or editor—feels that he can safely trust his accompanist—or printer—and concentrate on his own part, his work is ten times easier and probably ten times better.

It is realised that the YEAR BOOK appeals mainly to the professional and commercial branches of radiotelegraphy and, for this reason, not much space has been allotted to the subject of broadcasting which, perhaps, is of more interest to the amateur. For fuller particulars of this branch of wireless, the reader is referred to the companion publication, the "Wireless Annual for Amateurs and Experimenters."

THE EDITOR.

12/13, Henrietta Street,
Strand, London, W.C.2.
1924.

1924 CALENDAR 1924

<div>JANUARY</div> <div><div>S</div>.. — 6 13 20 27</div> <div><div>M</div>.. — 7 14 21 28</div> <div><div>T</div>.. 1 8 15 22 29</div> <div><div>W</div>.. 2 9 16 23 30</div> <div><div>T</div>.. 3 10 17 24 31</div> <div><div>F</div>.. 4 11 18 25 —</div> <div><div>S</div>.. 5 12 19 26 —</div>
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New Year's Day (Tuesday) ..	January 1st	Bank Holiday	August 4th
Good Friday	April 18th	Armistice Day	November 11th
Easter Day	April 20th	St. Andrew's Day ..	November 30th
St. George's Day	April 23rd	Queen Alexandra's	
King's Accession	May 6th	Birthday ..	December 1st
Empire Day	May 24th	Christmas Day (Thursday)	December 25th
Queen's Birthday	May 26th	Wattle Day (Australia) ..	January 26th
King's Birthday	June 3rd	Union Day (South Africa)	May 31st
Whit Sunday	June 8th	Dominion Day (Canada) ..	July 1st
Prince of Wales' Birthday ..	June 23rd	Independence Day (U.S.A.)	July 4th

1923 CALENDAR 1923

JANUARY	FEBRUARY	MARCH	APRIL
S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 31 T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 — F .. 2 9 16 23 — S .. 3 10 17 24 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 31	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 — W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —
MAY	JUNE	JULY	AUGUST
S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 31 F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 3 10 17 24 M .. — 4 11 18 25 T .. — 5 12 19 26 W .. — 6 13 20 27 T .. — 7 14 21 28 F .. 1 8 15 22 29 S .. 2 9 16 23 30	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 31 W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 31 S .. 4 11 18 25 —
SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
S — 2 9 16 23 30 M — 3 10 17 24 — T — 4 11 18 25 — W — 5 12 19 26 — T — 6 13 20 27 — F — 7 14 21 28 — S 1 8 15 22 29 —	S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 31 T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 —	S — 2 9 16 23 30 M — 3 10 17 24 31 T — 4 11 18 25 — W — 5 12 19 26 — T — 6 13 20 27 — F — 7 14 21 28 — S 1 8 15 22 29 —

1925 CALENDAR 1925

JANUARY	FEBRUARY	MARCH	APRIL
S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 31	S .. — 1 8 15 22 M .. — 2 9 16 23 T .. — 3 10 17 24 W .. — 4 11 18 25 T .. — 5 12 19 26 F .. — 6 13 20 27 S .. — 7 14 21 28	S .. 1 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 31 W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 — S .. 4 11 18 25 —
MAY	JUNE	JULY	AUGUST
S — 3 10 17 24 31 M — 4 11 18 25 — T — 5 12 19 26 — W — 6 13 20 27 — T — 7 14 21 28 — F 1 8 15 22 29 — S 2 9 16 23 30 —	S .. — 7 14 21 28 M .. 1 8 15 22 29 T .. 2 9 16 23 30 W .. 3 10 17 24 — T .. 4 11 18 25 — F .. 5 12 19 26 — S .. 6 13 20 27 —	S .. — 5 12 19 26 M .. — 6 13 20 27 T .. — 7 14 21 28 W .. 1 8 15 22 29 T .. 2 9 16 23 30 F .. 3 10 17 24 31 S .. 4 11 18 25 —	S — 2 9 16 23 30 M — 3 10 17 24 31 T — 4 11 18 25 — W — 5 12 19 26 — T — 6 13 20 27 — F — 7 14 21 28 — S 1 8 15 22 29 —
SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 — F .. 4 11 18 25 — S .. 5 12 19 26 —	S .. — 4 11 18 25 M .. — 5 12 19 26 T .. — 6 13 20 27 W .. — 7 14 21 28 T .. 1 8 15 22 29 F .. 2 9 16 23 30 S .. 3 10 17 24 31	S .. 4 8 15 22 29 M .. 2 9 16 23 30 T .. 3 10 17 24 — W .. 4 11 18 25 — T .. 5 12 19 26 — F .. 6 13 20 27 — S .. 7 14 21 28 —	S .. — 6 13 20 27 M .. — 7 14 21 28 T .. 1 8 15 22 29 W .. 2 9 16 23 30 T .. 3 10 17 24 31 F .. 4 11 18 25 — S .. 5 12 19 26 —

NOTABLE DATES IN WIRELESS HISTORY

January	20th, 1904.	First Press Message transmitted across Atlantic.
"	20th, 1914.	Safety of Life at Sea Conventions signed in London.
"	21st, 1914.	First Presidential Address to the Wireless Society of London.
"	22nd, 1901.	Station at the Lizard opened.
"	27th, 1912.	Aranjuez Station opened by King Alfonso XIII.
February	2nd, 1896.	Senatore Marconi came to England.
"	11th, 1901.	Communication established between Niton and the Lizard. 196 miles.
"	18th, 1900.	First German Commercial W/T Station opened on Borkum Island.
"	21st, 1911.	Judgment given in favour of Marconi Co. upholding Patent No. 7777.
"	28th, 1900.	Communication up to 60 miles between s.s. <i>Kaiser Wilhelm der Grosse</i> and Borkum Island.
March	1st, 1901.	Wireless Service inaugurated in the Hawaiian Islands.
"	23rd, 1906.	First high-power directional aerial used at Clifden.
"	27th, 1899.	Communication established between Wimereux and South Foreland Lighthouse.
April	15th, 1912.	S.S. <i>Titanic</i> struck iceberg and sank.
"	24th, 1903.	Cie Française Maritime et Coloniale de T.S.F. formed.
"	25th, 1900.	Marconi International Marine Communication Co., Ltd., incorporated.
"	26th, 1900.	Marconi took out Patent No. 7777.
May	13th, 1897.	Communication established over 8 miles.
"	21st, 1901.	First British ship, s.s. <i>Lake Champlain</i> , equipped with wireless telegraphy.
June	2nd, 1896.	Application lodged for Marconi's first British Patent No. 12039, of 1896.
"	3rd, 1898.	Lord Kelvin sent first paid Radiotelegram from the Needles Station.
"	25th, 1902.	First magnetic detector installed in Italian cruiser <i>Carlo Alberto</i> .
July	5th, 1912.	International Radiotelegraph Convention signed in London.
"	5th, 1913.	London Wireless Club inaugurated (the nucleus of the Wireless Society of London and the Radio Society of Great Britain).
"	17th, 1897.	Communication up to 10 miles between Spezia and Italian cruiser <i>San Martin</i> .
"	20th, 1897.	Wireless Telegraph and Signal Co., Ltd., incorporated.
"	20th, 1898.	Events of Kingstown Regatta reported by Radiotelegraphy.
"	24th, 1903.	Agreement by British Admiralty for use of Marconi system in the Navy.
"	27th, 1896.	First demonstration of Directional Wireless using reflectors.
"	27th, 1915.	Communication established between San Francisco and Japan via Honolulu.
"	28th, 1916.	Regulation published making W/T compulsory on British vessels of 3,000 tons or over.

August	3rd, 1898.	Communication established between Royal Yacht <i>Osborne</i> and Ladywood Cottage, Osborne.
"	4th, 1903.	First International Conference on W/T held in Berlin.
"	4th, 1914.	War declared on Germany and all private radio-telegraphy suspended.
"	15th, 1904.	Wireless Telegraph Act of Great Britain passed.
"	18th, 1921.	Leafield (Oxford) Station opened by P.M.G.
"	19th, 1920.	Communication established between an aeroplane in flight to Paris and a telephone subscriber in London.
September	12th, 1923.	Sir E. Rutherford's address to the British Association at Liverpool simultaneously broadcast from all B.B.C. Stations.
"	29th, 1909.	British Coast Stations taken over by the Postmaster-General.
October	1st, 1922.	First All-British Wireless Exhibition opened.
"	8th, 1908.	Russian Company of Wireless Telegraphs and Telephones formed.
"	15th, 1901.	First Fan Aerials erected for experiments between Poldhu and Newfoundland.
"	17th, 1907.	Transatlantic Stations at Clifden and Glace Bay opened for public service.
"	26th, 1901.	Cie. de T.S.F. of Brussels formed.
"	26th, 1915.	Radiotelephonic communication effected between Arlington, U.S.A. and the Eiffel Tower.
November	1st, 1902.	Marconi Wireless Telegraph Co., of Canada, formed.
"	2nd, 1900.	First wireless land station in Belgium opened at Lapanne.
"	15th, 1899.	Communication up to 30 miles between the Needles Station and s.s. <i>St. Paul</i> .
"	16th, 1904.	Dr. J. Ambrose Fleming's original patent for valves, No. 24850, taken out.
"	22nd, 1899.	Marconi's Wireless Telegraph Co. of America formed.
"	22nd, 1922.	The Wireless Society of London changed its title to the Radio Society of Great Britain.
December	6th, 1897.	Communication established up to 18 miles between the Needles and a steamer.
"	12th, 1896.	Sir W. H. Preece lectured on Marconi's invention at Toynbee Hall.
"	12th, 1901.	Signals received at St. Johns, Newfoundland, from Poldhu, a distance of 1,800 miles.
"	15th, 1922.	British Broadcasting Co., Ltd., incorporated.
"	17th, 1902.	First Wireless Message transmitted across the Atlantic.
"	18th, 1902.	Messages despatched by Senatore Marconi and Earl Minto to King Edward VII and King Victor of Italy.
"	18th, 1921.	Demonstration of Duplex Radiotelephony between London and Amsterdam.
"	24th, 1910.	Cia Nacional de T.S.H. formed.

For other events to which no exact date can be fixed refer to the Record of the Development of Wireless Telegraphy and Telephony, on pages 5 to 20.

RECORD OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY AND TELEPHONY, AND INTERESTING ITEMS IN CONNECTION THEREWITH

By W. H. NOTTAGE, B.Sc., A.M.I.E.E., F.Inst.P.

The record below is intended to constitute a résumé, arranged in chronological order, of the outstanding events in wireless telegraphy from year to year.

This is a feature which has figured in the YEAR BOOK from its initiation in 1913. The record of the earlier years has now been consolidated under appropriate headings, while that for the last few years remains under annual headings. The record for the past year will be found in an extended form at the end of this section.

(A) HISTORICAL SURVEY.

Prelude.

In 1840 Joseph Henry produced high frequency oscillations by the discharge of a condenser, and in 1853 Lord Kelvin in a paper, "On Transient Electric Currents," deduced mathematically the conditions necessary for electrical oscillations in a circuit, and showed that if the resistance was negligible the frequency was inversely proportional to the geometric mean of the capacity and inductance. In 1873 James Clerk Maxwell published his great work, "Electricity and Magnetism," wherein he showed mathematically that an electrical oscillation in a circuit would give rise to an electromagnetic disturbance, which would travel away as a free wave with a finite velocity. He also postulated that light was such an electromagnetic wave.

In 1887 Heinrich Rudolph Hertz produced Maxwell's electromagnetic waves, and was able to measure their length and velocity and to show that they followed the ordinary laws of interference, refraction, and polarisation. In 1892 Edouard Branly discovered that a coherer, similar to the tube of filings which had been used by David Hughes some 13 years earlier, was very sensitive to electromagnetic waves. In 1894 Sir Oliver Lodge repeated some of the experiments of Hertz with improved apparatus, including coherers instead of the minute spark gaps used by Hertz.

Plain Aerial.

In 1896 Guglielmo Marconi took out the first patent for Hertzian Wave Telegraphy (No. 12039 of 1896), according to which, besides many minor improvements in the apparatus, one end of the Hertzian dumb-bell oscillator was buried in the earth, and the other end was elevated into the air; and with this apparatus he succeeded in communicating nearly two miles. In 1897 Sir Oliver Lodge took out a patent for Syntonic Wireless Telegraphy, according to which, by sacrificing some of the radiating properties of the Marconi aerial, he obtained more prolonged oscillations and better selectivity.

1898 Wireless Telegraphy found its first practical use in connecting the East Goodwin lightship with the shore, while in the following year communication was established across the English Channel, a distance of 85 miles was attained between two ships at sea, and Wireless Telegraphy was first used for military purposes in the South African War.

Coupled Circuits.

In 1900 Marconi patented coupled circuits, which enabled more energy to be transmitted and greater selectivity to be obtained. In 1901 the five principal islands of the Hawaiian group were connected up by Wireless telegraphy, and at the end of the year signals were received across the Atlantic in St. John, Newfoundland, from Poldhu, Cornwall—a distance of 1,800 miles. Early in 1902 messages were received at more than 1,500 miles, and signals up to a distance of more than 2,000 miles from shore to ship, while at the end of the year the first wireless message, as distinct from mere signals, was transmitted across the Atlantic. This year also saw the introduction of the Marconi magnetic detector.

In 1903 V. Poulsen, improving on the work done by W. Duddell three years earlier, introduced the arc generator of continuous oscillations.

New Detectors.

In 1904 J. A. Fleming, developing the so-called Edison effect which had been known since 1883, produced the thermionic valve. In 1905 Marconi introduced directional aerials. In 1906 H. H. C. Dunwoody discovered that carborundum crystals, and G. W. Picard that silicon crystals, could be used as wireless detectors; and R. A. Fessenden invented heterodyne reception. In 1907 Lee de Forrest, who had the previous year put a third electrode into the Fleming valve, introduced the grid between the filament and the plate in his "Audion"; and in the same year E. Bellini and A. Tosi produced the Radiogoniometer, or Wireless Direction Finder. In 1908 Max Wien invented the quenched spark. In 1909 R. Goldschmidt designed his machine for generating continuous oscillations.

In 1910 messages were received on a ship at sea at a distance of 4,000 miles by day, and 6,735 miles by night, from Clifden. In 1911 R. von Lieben showed that the three electrode thermionic tube or triode could be used as a proportional relay. In 1912 the "Titanic" sank after striking an iceberg, the lives of more than 700 passengers being saved by her wireless call for assistance.

Telephony.

In 1913 A. Meissner produced continuous oscillations by the reaction of a triode upon itself, and C. S. Franklin utilised the same principle for the elimination of the losses in receiving circuits. In 1914 I. Langmuir produced really hard thermionic tubes, and entirely eliminated ionisation therein.

Later in the year began the Great War, which temporarily suspended all commercial circles, and left little to chronicle during its continuance. In 1915 a wireless telephone message was sent across the Atlantic from Arlington to the Eiffel Tower. In 1916 the determination of the difference in longitude between Paris and Washington with the aid of wireless telegraphy, which had been in progress since 1913, was completed, and the result found with a probable accuracy of the order of 0.01 second of time.

With the cessation of the war in 1918 it became known that, although there had been no outstanding discoveries in wireless telegraphy, a steady development had taken place, and, in particular, that the triode had become of the first importance, both as a receiving amplifier and as a generator of continuous oscillations, which had brought wireless telephony into the practical field. Later in the year messages transmitted from Carnarvon, Wales, were received in Sydney, Australia, a distance of 12,000 miles. In 1919 wireless rendered great assistance to the transatlantic flights of the American aeroplane and the British dirigible.

During 1920 the principal events includes the completion of the Lafayette radio station at Bordeaux, the construction of which was commenced during the war by the United States Navy.

Tests were successfully carried out in August of that year, and the station is now carrying on a commercial service.

The high power station at Sayville, which was closed by the United States authorities during the war, was reopened for traffic in April of this year, and a new station at Christiania was opened on January 10th for European traffic only, the Stavanger station being reserved for traffic with the United States.

A number of Direction Finding stations, both in this and other countries, which were originally put up by Government Departments for wartime use, were also made available for merchant service purposes, and have given valuable aid in navigation in difficult waters.

In order to relieve the congestion on the internal telegraph network, the German Government erected a number of medium power radio stations in the important industrial centres of the country. The majority of the pre-war Press, Time Signals, and Meteorological Services were re-established in most countries. A novelty in this direction was the establishment of an astronomical service from the Nauen Station to give information on important astronomical events to all neighbouring observatories, so that observations on outbursts of novæ and similar phenomena could be taken in hand without delay. The British Air Ministry established a comprehensive scheme of meteorological bulletins, which are transmitted both from their own station and from the Aberdeen Wireless Station several times during the twenty-four hours. These messages give the latest information about flying conditions over the British Isles and neighbouring countries.

The most noticeable improvements in commercial apparatus have been those of wireless telephonic apparatus carried out by Marconi's Wireless Telegraph Company at Chelmsford. On a number of occasions during the year transmissions were carried out from that station using as much as 15 kW., and regular concert programmes were transmitted. These transmissions were picked up as far away as St. John's, Newfoundland, a range of 2,673 miles, while ships 1,000 miles at sea also overheard the programmes. The successful linking up of wireless telephonic apparatus with the land line telephones was accomplished, and on August 19th, a successful connection was established between a subscriber's instrument in London and an aeroplane in flight on its way to Paris. Regular wireless telephonic transmissions have also been carried on from a Dutch Wireless Station.

The Government of India formed an Indian Wireless Telegraph Board, with a view to extending and reorganising its existing telegraph system, in order to meet the strategic, political and commercial requirements of the Empire.

The Department of Scientific and Industrial Research established four sub-committees to assist the Radio Research Board. These were to deal respectively with the following branches of radio research : (a) the propagation of wireless waves ; (b) atmospheric ; (c) directional wireless ; (d) thermionic valves.

Certain modifications were made in the rules and regulations governing wireless telegraphy in the British Mercantile Marine. As from September 1st, 1920, automatic call apparatus may be installed subject to the approval of the Board of Trade. For voyages other than coastwise ones exceeding 48 hours from port to port, any vessel carrying 200 passengers or more must carry three operators. For voyages exceeding eight hours, but less than 48 hours from port to port, two operators must be carried. Regulations were also issued relative to the carrying of wireless telegraph watchers on board in place of one or more certificated wireless operators.

1921.

In January, 1921, the foundation stone was laid of a new ultra-powerful wireless station at Sainte Assise, near Paris. Work on this station—known as the Paris Radio Central—has progressed rapidly, and the first portion of the station is now completed. This central station is to be divided into

three sections, devoted respectively to Long-range Oversea communications, Continental routes in Europe, and special duplex services to London and Madrid. The latter services were inaugurated during the year, and are now in regular operation, the average working speed between London and Paris being about 80 words per minute in each direction.

Work has also progressed rapidly on the New York Radio Central Station on Long Island, and on November 5th, President Harding formally opened the first section of this station.

In Java the Dutch Colonial Authorities commenced the construction of a very large arc station to absorb up to 3,500 kilowatts, with which it is hoped to establish uninterrupted communication with Holland.

On November 20th test messages transmitted from Carnarvon with a new valve transmitting plant were read in Australia, a distance of approximately 12,000 miles. Special press messages were also transmitted.

On December 18th, a demonstration of duplex wireless telephony between London and Amsterdam, Holland, was given by Marconi's Wireless Telegraph Company, Limited. For the purpose of the demonstration Marconi House, London, was linked by means of the ordinary trunk line with the wireless station at Southwold, and a similar arrangement was made in Holland between the wireless station at Zandvoort and the Amsterdam Stock Exchange. An unusually short wavelength was employed, giving immunity from interference from other stations.

The first station of the British Imperial Wireless Chain at Leafield, near Oxford, was formally opened on August 18th by the Postmaster-General. A 250 kW. arc set fitted at this station, which is ultimately to be employed for communication with a station at Cairo.

An International Wireless Conference was held in Paris in June, at which representatives from the leading nations discussed the regulation of the use of wireless and the allocation of certain wavelengths for various ranges and purposes.

An Imperial Conference was held in London during July and August to discuss improved communications within the British Empire. With regard to wireless communications it was agreed that steps be taken by H.M. Government for the erection of the remaining stations of the Imperial chain for which they are responsible, that the Governments of the Union of South Africa, of Australia and of India, should take similar action, and that the Government of Canada and New Zealand should co-operate. The Radio Research Board were also asked to investigate and report on the development and present position of Wireless Telephony.

La Compagnie Radio-France was constituted in June for the construction erection and working of radio stations in France for European and Transocean communication.

The Radio Corporation of America effected agreements or amalgamations with the following firms to enable a pooling of all radio patents owned by them to be made:—The Westinghouse Electric and Manufacturing Company, The American General Electric Company, The International Radio Telegraph Company, the American Marconi Company, the American Telephone and Telegraph Company, and the United Fruit Company.

A merger was also effected between the Marconi Wireless Telegraph Company of Canada and the Canadian General Electric Company.

By agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., took over and agreed to operate for a period of twenty-five years the whole of the postal, telegraph and wireless services of Peru,

Sir William Slingo, late Engineer-in-Chief of the British Post Office, has accepted the position of Chief of the Department. The Compagnie Générale de T.S.F. has also concluded a contract for a period of thirty years with the Government of Ecuador for the working of similar services in that State.

The progress made in amateur and experimental wireless is exemplified by the attempts made in February and December of this year to effect communication on short wavelengths between the wireless amateurs of America and Great Britain. The first attempt was unsuccessful, but during the second test, signals from many American amateur stations were heard both by British radio amateurs and by a representative of the American Radio Relay League. The American Radio Relay League held its first Annual Convention in Chicago between August 30th and September 3rd.

1922.

During this year the first steps were taken in Great Britain to start the broadcasting of wireless telephony, which, as will be seen from the record for the year just passed, has assumed such large proportions. The question was referred to the Wireless Sub-Committee of the Imperial Communications Committee, and the recommendations made by them were accepted by the Government, and, as is mentioned below, a Broadcasting Company was founded.

Experimental and theoretical work on valves continued to make progress, a theory which takes into account the non-linear character of the valve characteristic was given by Dr. Van der Pol.

Valves in which the anode is a metal cylinder sealed to a glass positive and capable of giving an output of 100 kW. energy, were manufactured by the firm of Phillips, in Holland.

In Australia an agreement was made with Amalgamated Wireless (Australasia), Ltd., by the Government by which all the wireless services existing in the country were combined under the joint ownership of the Company and the Government.

The nominal capital of the Amalgamated Wireless (Australasia), Ltd., was increased to a total of £1,000,000 made up of 1,000,000 ordinary shares of £1 each. The Commonwealth Government has taken up 500,001 shares, and the whole of the remaining shares have been subscribed among the private shareholders. The Board of Directors is made up of three nominated by the Commonwealth Government, three elected by the private shareholders, and a seventh Director elected by a majority vote of the other six, or appointed by arbitration.

The Company took over the whole of the coastal and commercial land stations in Australia, Papua, and in New Guinea, together with the entire staff of the Commonwealth Radio Service.

The Company is required to proceed with the development of all branches of wireless communication, including the following :—

- (1) To establish direct commercial communication between Australia and Great Britain.
- (2) To establish direct commercial communication between Australia and North America.
- (3) To establish a wireless feeder station in the capital city of every State to link with the high-power trans-ocean service.
- (4) To combine with the feeder services a re-equipped coastal service for improved communication with merchant ships around the coast of Australia.
- (5) To extend the manufacture of wireless apparatus in the Commonwealth.

The principal features of progress in wireless that were recorded in China were the following :

During the summer a 25 kW. arc station at Urumsti (Eastern Turkestan) was completed, and this station has been in direct communication with several stations in India. The transportation of material for this station and its construction represents quite an important event inasmuch as it links together India and China.

A 25 kW. arc station was under construction at Kashgar.

Remarkable possibilities have been opened by some pioneer work on short wave directional wireless begun by Senatore Marconi in 1916, and continued recently by C. S. Franklin. The former used short damped waves of two or three metres, while the latter has concentrated on the use of continuous waves of about 15 metres obtained by means of thermionic valve transmitters. Large reflectors were used, which, besides giving marked directional effects, made wireless telephony carried out with the same wavelength almost distortionless. With the use of reflectors of dimensions large compared with the wavelength the directional effect is very marked, so that the possibility of a wireless "lighthouse" with a revolving beam is definitely established.

In France progress was made in the construction of high frequency alternators, the efficiencies of the 250 kW. 20,000 cycle alternator being about 79 per cent., and of a 500 kW. 15,000 cycle machine about 84 per cent. Static frequency multipliers were investigated by M. Marius Latour, who developed one with a magnetic circuit of an iron-nickel-manganese alloy having a very high resistivity, and reaching saturation at very low magnetic induction.

An important development in Germany was the wireless telephone transmission of messages by the "Eildienst-Gesellschaft m.b.H." Since September 1st, 1922, a continuous wireless telephone service has been maintained every day from 8 a.m. till 6 p.m., on a wavelength of 4,000 metres, by the 10-kW. Telefunken valve transmitter of the Königswusterhausen station, about 30 km. from Berlin; the transmitter is operated from Berlin. Messages chiefly concern the rate of exchange in Berlin, London, Paris, New York as well as the "Weltmarkt" prices of the most important raw materials. As aërials, small L. and T. antennæ five to ten metres above the roofs are used. The receivers consist of a simple audion with coupling reaction and secondary circuit, or for a distance of more than 300 km., a two-valve audio frequency amplifier.

In Japan steady progress was made in the development of high frequency telephony over power lines and radiotelephony over short distances. Successful communication was effected by high frequency telephony over the lines of the Ujigawa Electric Company, the line employed being 34 kilometres long and carrying a 55,000 volts three-phase supply.

1923

BROADCASTING.

PROBABLY the most notable feature in wireless communication of the year which has just passed is the great extension in broadcasting, or the transmission of news and entertainment to an unlimited audience. In the United States of America broadcasting was practised on a large scale before the commencement of the period under review, and even there a noteworthy feature has been the equipment and putting into service of a number of stations with every facility for transmitting programmes of the highest technical quality.

In Great Britain the British Broadcasting Company was incorporated on December 15th, 1922, Lord Gainsford being appointed Chairman. The

Company immediately set to work to erect a chain of eight Broadcasting Stations. The actual commencement of broadcasting, however, took place before the formal incorporation of the Company at three centres: London, Manchester and Birmingham. Since then stations have been put into service at Cardiff, Newcastle, Glasgow, Bournemouth and Aberdeen, and the temporary stations at Manchester and Birmingham have been replaced by permanent ones.

The erection of a relay station at Sheffield has been completed and the provision of another at Plymouth has been decided upon. These latter are intended to have lower power than the main centres, and the programmes are for the most part transmitted from one of the latter over the Post Office telephone lines.

The quality of the entertainments and other matters broadcast has been very high and there has been a wide range in variety. Besides the musical and vocal items which naturally form the bulk of the programme, sermons and short talks of all kinds of matters of interest have been given. In addition to this, items of news, weather reports and time signals form a daily feature. Perhaps the most noteworthy event in this direction was the broadcasting in September last of the Presidential Address delivered by Sir Ernest Rutherford, F.R.S., before the meeting of the British Association for the Advancement of Science at Liverpool. This was noteworthy in being transmitted from all the stations simultaneously.

The broadcasting of concerts, etc., is also carried out in France, Holland, Germany, Denmark, Italy, Brazil and Argentina, and proposals for the formation of Broadcasting Companies have been made in Norway, Sweden, South Africa and Australia.

In Australia a conference on Broadcasting has proposed that broadcasting should be decentralized. Each district will have a Broadcasting Company which will use a fixed wavelength and will obtain its revenue from listeners who will have sealed instruments. Preference will be given to Australian and British instruments.

The revenue of the British Broadcasting Company was to be derived from two sources, in the first place they were to receive half of the fee of ten shillings charged by the Post Office for the licence, and in the second place a royalty on the sale of instruments by the firms which composed the Broadcasting Company. These instruments were of types approved by the Post Office and have the British Broadcasting Company's trademark.

The construction of home-made receivers attained to such dimensions, and also the number of persons who neglected to obtain the Government licence was estimated to be so large, that the prospects of the revenues of the Broadcasting Company were seriously affected. Accordingly the Postmaster-General appointed a Committee to consider the whole question. As a result of the Committee's deliberation, it has been proposed that the Broadcasting Company shall have three-quarters of the licence fee, but that the royalties on the sale of apparatus shall be discontinued. The actual proposals have not been adopted, but the royalties have been reduced and the proportion of the licence increased. Special licences have been issued for those who desire to construct their own sets and also for those who have already done so.

At the time of writing the total number of licences issued approaches half-a-million, and there is therefore no doubt that this indicates that broadcasting has taken a firm foundation.

In the United States a Government return puts the number of broadcasting stations which were in working order in July at 450, though the total of active stations is stated to be 581. The total number of licences issued was 826.

In the United States a company known as Wired Radio, Inc., has been formed for the development of broadcasting over the power lines of a number of electric supply companies. The receiving instruments being connected directly with the lighting circuit no aerial is required, which is naturally an advantage in many urban localities. Telephony over power lines has, of course, been already employed for communicating between the various stations of power supply networks, but the present scheme presents the novel combination of a purely utilitarian and a recreational service being provided by the same means.

In Southern Ireland negotiations are taking place between the Postmaster-General and a number of firms. It is stated that probably six firms will be included in a broadcasting company, and that a station will be erected at Dublin, and possibly relay stations at Cork and Limerick.

In Sweden a broadcasting company, the Svenska Rundradiobolaget, has been founded in Stockholm by five companies concerned in electrical industry.

Six transmitting stations, having a power of from 500 to 1,500 watts, and working on wavelengths between 350 and 650 metres, are to be erected.

A broadcasting company at Sydney, New South Wales, has organised a comprehensive scheme for broadcasting.

A broadcasting service has been started at Wellington, New Zealand, by a company styled Broadcasters, Ltd., founded by local radio dealers. News and musical items are broadcast on four evenings a week.

Imperial Scheme.

THE Imperial Scheme, as the chain of radio stations which are to link the various units of the British Empire together is termed, has not yet been finally settled. The delay is due to the fact that the Postmaster-General and the Marconi's Wireless Telegraph Co., Ltd., have not yet come to an agreement as to the terms on which the latter can obtain the licence to construct and work the British station which they propose to erect for communicating with the Overseas stations of the scheme. The political situation existing at the end of 1923 will, in all probability, cause a further unfortunate delay in the negotiations.

The scheme contemplated is that the British Post Office will erect a station and the Marconi Company another. These will communicate directly with the Overseas stations, and not through a chain of intermediate stations at distances of 2,000 miles apart as was recommended by the Imperial Wireless Telegraph Committee in 1920.

The Post Office has acquired an area of 800 acres at Hillmorton, near Rugby, and are making plans for the erection of a transmitting station to form part of the Imperial Wireless Scheme.

The direct wireless communication between Australia, Great Britain and Canada, is in process of realisation.

The Marconi Company have made a tender, which has been accepted, for the erection of a transmitting station in Australia of a power of 1,000 kilowatts, with 20 steel masts 1800 feet high. Corresponding stations are to be provided in England and Canada. The receiving arrangements will permit of simultaneous reception from five stations.

High Power Stations.

IN India it has been proposed to hand over to private enterprise the construction and working of the high power station required for communication to other countries. Agra has been proposed as the most suitable site for this station.

In South Africa a company called "The Wireless Company of South Africa" has been registered at Cape Town. The capital is £560,000, and the company has been formed for erecting and working a station for overseas communication. The Marconi Company owns four-fifths of the shares, and the South African Government the remainder. The Company has the use of the Marconi patents free of payment.

A recent article in the *Jahrbuch der drahtlosen Telegraphie* gives some details of the radiotelegraphic organisation in Russia. There are at present (including both transmitting and receiving) some 300 stations. The principal transmitting stations are at Moscow, where one station is of 150 kilowatts and another is for internal communication, whilst a third is for radiotelephony. The reconstruction of these stations is now being undertaken by the Commissariat of Posts and Telegraphs.

It is proposed to equip eleven receiving stations in Moscow with loud speakers for broadcast reception of propaganda.

The new high power station at Warsaw, which has been erected by the Radio Corporation of America, has just been completed.

Direct wireless services between America and Holland and America and Italy have recently been put in operation.

The land line telephone system of Denmark has been linked up to the Island of Bornholm by means of radio telephone transmitters on that island, and at Lyngby, near Copenhagen. The distance between these transmitters is 150 kilometres (93 miles). The Poulsen system is employed, the sets being of 1 and 2 kW. power respectively, and the wavelength 2,000 metres.

A French company is constructing a 100 kilowatt station at Rakovica, near Belgrade, with a receiving station at Laudon Trench, a suburb of the latter city.

In Belgium the erection of a new high power station has been commenced at Ruysselede, near Bruges.

A wireless station is being erected on Nova Zembla for communicating with Archangel and Siberia.

A station for which plans are being prepared, to be located at Vardoe, Norway, is intended for communication with Ingoe, near Hammerfest, and with Tromsø. The latter station will send meteorological information, which will be of great use to fishing vessels in northern waters.

An Austrian Marconi Company, with a capital of £130,000, has been founded, and is proceeding with the erection of a high power station at Vienna for communicating with foreign countries, for which a thirty years' monopoly has been granted. The company has taken over the various Austrian stations which were erected during the war.

The German high power station at Nauen has had extensive additions made to it to fit it for carrying on communication with various places.

Separate aerials are being constructed for the American, Asiatic, African and two European services. Communication will be also carried out with the Monte Grande station near Buenos Aires.

A large radio station is under construction in a valley between the Herzogstand and the Stein, two of the foothills in the Bavarian Alps. The aerial will be suspended by wire cables stretched between the tops of the two

hills, the aerial wires being suspended from these cables. To maintain a uniform tension in this arrangement the cables at the Stein end are passed over a pulley and fixed to a counterweight in the form of a car, which is placed on an inclined track, up which it is free to move. A 2,000 kW. Poulsen Lorenz arc, and a Schmidt-type high frequency alternator, will be installed, and it is hoped to make comparative tests between these two systems.

Communication between Holland and Dutch East Indies is being effected by the erection of stations at Assel, in Holland, and Malabar (Java), by the Telefunken Company. The official opening of the service, which was to have occurred on May 5th last, was delayed owing to the Malabar station being damaged by lightning.

Four high power stations are under construction for communication between France and her Colonies. At Bamako, near Timbuktu, duplicate high-frequency alternators are to be installed, and will give an aerial input of 100 kilowatts. The aerial will be carried by six 120-metre masts, a total length of 1,000 metres being attained by means of four shorter masts.

At Brazzaville, in the Middle Congo, Poulsen arcs in duplicate for an aerial input of 70-100 kilowatts will be used. The aerial will be carried by eight 150-metre masts, and will be 900 metres long.

At Tanarive, Madagascar, high-frequency alternators of 250 kW. rating will be used, and the aerial will be carried by eight 200-metre masts.

Saigon, Cochin China, which has already carried out tests, has two 500 kilowatt and one 250 kilowatt alternator. The aerial is supported by eight 250-metre masts, and an earth system similar to that at Ste. Assise is used.

By the erection of high power stations by the Marconi Company Portugal will, in the near future, be provided with an efficient and up-to-date system of communication with her colonies.

On the conversion of the Madras Wireless Station for high speed automatic signalling, which is now being effected, the traffic between India and Burma will be diverted to this station from the cable and land lines between Calcutta and Rangoon.

An agreement has been made between the Radio Corporation of America and the Chinese Government for the erection of five high power stations in China, the principal one being at Shanghai.

Lower power stations will also be erected for communication between Shanghai, Peking, Canton and Harbin. The stations will be erected by the Federal Telegraph Company, who will operate them jointly with the Chinese Government, and they are expected to be completed in 1925.

The Japanese Missui Company have recently completed the erection of a station at Peking, and communication has been established with Bordeaux.

A high power station is under construction by the Brazilian Wireless Telegraph Co.

The Punta Arenas station in Southern Chile, has recently been equipped with a valve continuous wave transmitter, and has established communication with Stanley, Falkland Islands.

The Monte Grande station, which has recently been put into service, is a high power Argentine station, and has a T-shaped flat-topped aerial, carried by ten masts of 210 metres, spaced 500 metres apart, and having multiple earth connections. The plant comprises two 400 kilowatt high frequency alternators, which will give a radiation of 110,000 metre-amperes. The receiving station is at Villa Elisa, nearly 40 kilometres from both Monte Grande and Buenos Aires.

In Mexico a system involving the erection of 42 stations has been arranged for. There will be eight central stations and a number of sub-stations, and consist of valve transmitters for continuous or interrupted continuous waves as desired. The aerials are of the umbrella type with two distinct sections, the upper one for wavelengths between 1,200 and 3,000 metres, and the lower section for wavelengths between 600 and 1,200 metres.

The Canadian Government are erecting six stations, primarily for official use, at Dawson City and places on the Mackenzie River.

Marine.

MARCONI'S Wireless Telegraph Co., Ltd., has designed a wireless set for a ship's lifeboat, which was exhibited at a recent exhibition. The set is self-contained and is provided with its own petrol engine and alternator. The power is $\frac{1}{4}$ kilowatt and the range 50 miles. It is estimated that one gallon of petrol will allow 90 transmissions each of ten minutes.

The receiver is provided with a loop aerial, which would enable the lifeboat to guide a ship towards it.

An investigation made by the Western Electric Company and the American Telephone and Telegraph Company on the possibility of extending the Bell telephone system to ships at sea, gave important data which will prove of great service when it is possible to establish a commercial service of this nature.

Marconi's Wireless Telegraph Co. have also been investigating this subject, and a paper on the subject was read at the recent meeting of the British Association at Liverpool by Capt. J. A. Slee.

The increase in traffic on some of the large liners of the Atlantic route has led to the installation of apparatus for high speed automatic transmission and reception.

The White Star liner *Majestic* has been fitted with a continuous wave transmitter for this purpose. The oscillations are generated in a closed circuit by thermionic valves, and this circuit is coupled to the aerial by two coils, the effects of which oppose each other in the aerial coupling coil. Signalling is effected by short-circuiting one of the two coils, thus allowing the other to transfer energy to the aerial. When no energy is being transferred an artificial load is inserted in the closed circuit by the signalling key.

The messages are prepared on punched tape in the ordinary manner, and this is fed into an automatic transmitter as used in land telegraphy.

For reception the received signals are amplified and heterodyned by a local oscillator. The beat note from this is passed into a four-valve low-frequency amplifier, which is tuned to the beat frequency. For recording the signals the magnetic drum relay invented by Dr. McLachlan, which is referred to elsewhere, is used.

The Cunard liner *Berengaria* has also been fitted with apparatus of Creed manufacture for automatic reception and transmission, the record being made in Roman characters.

An article by Commander J. A. Slee on "The Progress of Wireless Telegraphy in the British Mercantile Marine during 1923" will be found elsewhere.

Aircraft.

SUCCESSFUL tests on wireless-controlled aeroplanes were carried out at the Etampes Aerodrome in France. Flights were made without a pilot.

Flights were also made with a pilot using a gyroscopic stabiliser and special steering motors which could be controlled from the ground.

The International Commission for Aerial Navigation has agreed, as a general principle, that all aircraft engaged in public transport must carry wireless apparatus. This provision is applied at present only to aircraft capable of carrying ten or more persons. Aircraft carrying fewer than ten persons and flying more than 100 miles over land without landing, or 15 miles oversea, will be required to install apparatus within two years.

Other Radio Developments.

A NUMBER of radio fog signals have been installed on the Atlantic and Pacific coasts of the U.S.A. One, which has been fitted at the Nantucket Shoals light vessel, which is 41 miles from land, gives a radio signal consisting of a group of four dashes every 30 seconds sent by an automatic transmitter. This enables vessels equipped with radio direction finders to obtain directional bearings of the light vessel. Eight of these signal apparatus have been installed, and five more are being established. Ten of the signals will be on lightships.

A method known as the radio-acoustic method, depending on the speed of sound in sea water for fixing the distance of a ship from a fixed station, has been investigated by a number of persons in various countries.

The principle consists in sending a sound through the water and simultaneously emitting a radio signal. Since the latter is received at the second station practically instantaneously the time of arrival of the submarine sound gives the distance between sender and receiver.

The Maas lightship has been equipped with a submarine signalling device sending the letter M, and an arrangement whereby the same letter is simultaneously sent by radio.

In a paper read before the Physical Society of London by Messrs. A. B. Wood and H. E. Browne, a method of marine direction finding, founded on the same process. In this method the ship is equipped with an apparatus to fire a small charge under water simultaneously with the emission of a radio signal.

A number of hydrophones are placed at suitable distances apart and connected to a shore station, where they are connected in series with one of the strings of a six-string Einthoven galvanometer photographic recorder, which has one string connected to the radio receiver.

The times of arrival of the submarine signal at the various hydrophones can be used to determine the position of the ship. The method has been used for determining the position of buoys and light ships.

The Philadelphia Police Department has acquired a number of police wagons equipped with radio receiving circuits, and a number of district police stations have been fitted with transmitting and receiving installations. By this means it is hoped more adequately to patrol the outlying districts of the area.

Railway travellers on the Paris-Bordeaux express are enabled to hear the concerts broadcast from the Eiffel Tower and Radiola. Four loud speakers are installed in the coach, and the aerial is formed by a number of wires in parallel along the length of the cars.

A number of demonstrations have been made recently showing the practicability of equipping motor cars with sets for receiving broadcast concerts both when drawn up at the roadside and also when in motion, and complete equipment for this purpose is now available.

The Police authorities employed radiotelephony to assist in controlling the traffic during the Epsom races. A fixed station was erected at the race course, and an aeroplane also equipped with wireless was employed for observing the traffic on the road and located congested points, whilst a wireless equipped motor car was provided to proceed to any locality required to keep in touch with the police patrols with motor cycles. The Marconi Company co-operated in the wireless problems involved.

Owing to the growth of the amateur wireless movement, no doubt largely stimulated by the interest taken in broadcasting by the general public, a number of new journals devoted to wireless telegraphy and telephony have been founded, whilst innumerable books on every aspect of the subject have been put on the market.

The number of local societies and clubs of amateur enthusiasts has largely increased, and since in many cases they are affiliated to the organisation which has previously been known as the Wireless Society of London, the importance and standing of this body was greatly enhanced. To mark this change in status from a local society into the leading organisation devoted to furthering the interest of radio communication from the amateur standpoint, the Wireless Society on November 22nd, 1922, changed its title to the Radio Society of Great Britain.

New Valves.

AN interesting form of receiving electrode tube has been described by Mr. A. W. Hull, of the Research Laboratory General Electric Co., U.S.A. This is a combination of the kenotron rectifier and plotron, which enables the employment of alternating current for supplying the energy required in a valve receiving circuit without the hum which usually accompanies its use when ordinary three-electrode valves are used. It consists of a filament consisting of a helix of tungsten wire placed within a nickel cylinder so that the latter is heated. The cylinder is coated with barium oxide and forms the cathode of the plotron. Since this cathode does not carry a current, but is heated by radiation from the internal filament, it is an equipotential surface. This has the advantage of increasing the steepness of the slope of the characteristic curve, and allows the valve to be used as a detector, which is not possible for an ordinary triode supplied with alternating current.

The filament and cylinder act as a rectifier for supplying the plotron anode with high tension. This is possible, since the outside of the cathode has a higher electron emission than the inside, due to its coating of barium oxide.

A resistance-capacity filter is employed, and the standard receiving circuits may be employed.

During the past year considerable progress has been made in the development of high power valves having external metal anodes. This construction allows the anode to be water-cooled. A number of patents exist for valves with water-cooled anodes, the anode being within the bulb, but the external anode allows of much more efficient cooling. The principal problem in the construction is the seal between the anode and the glass which is necessary for insulating the electrodes from each other and maintaining the vacuum in which they work.

The General Electric Company of America, have developed a valve capable of delivering 20 kilowatts of high frequency energy to an aerial. Using six of these in parallel with 15,000 volts on the anode a current of 310 amperes in an Alexanderson multiple tuned aerial was obtained.

A valve of the magnetron type has also been developed by the same company capable of giving 1,000 kilowatts at 20,000 cycles with an efficiency of 70 per cent.

In the ordinary three-electrode valve the magnetic effect of the current used to heat the filament does not have any important effect upon the electron emission from filament to anode. In a recent communication to the American Institute of Electrical Engineers, Mr. A. W. Hull has shown that in certain cases it is possible for this magnetic field to totally interrupt the electron emission when the filament current exceeds a certain value depending on the geometrical constants of the tube and the anode potential. This effect only becomes marked at very large filament currents, and hence can only be applied to any useful purpose at high powers.

New Apparatus.

A NEW loud speaker has been developed by the French Gaumont Company. In this a movable coil wound of aluminium wire is of conical form and fixed to a conical silk cloth. This is placed between the poles of an electromagnet which are shaped to fit. The speech current is passed through the coil, and owing to it having no pronounced resonant period, it is claimed that it will reproduce without distortion or suppressing or accentuating the harmonics. The sound passes through holes bored in one of the electromagnet poles.

The Frenophone is the name of a loud speaker which was recently exhibited at a meeting of the Royal Institution by Mr. S. G. Brown. In it a cork shoe is attached to the reed of a Brown telephone earpiece, and is vibrated by the sound currents passing through the coils. The shoe rubs lightly on a revolving glass disc and the slight vibration varies the friction between them considerably. To the shoe the diaphragm of a gramophone sound-box is attached and this reproduces the sound.

An interesting form of microphone, which is used in America for Broadcasting purposes is the Pallaphotophone. In this instrument a sensitive diaphragm has a tiny mirror attached so that when the diaphragm is vibrated by sound waves the mirror oscillates. A powerful beam of light is focussed on the mirror which reflects it on to a photo electric cell.

This cell has a battery in series and as it is more or less illuminated by the reflected beam, so the current through it will vary in proportion. The current is amplified by the usual methods and used to modulate a continuous wave transmitter.

An interesting development of this instrument is to make a record on a moving film (similar to a cinematograph film) of the sound to be recorded by the aid of the diaphragm and mirror. The film when developed may then be run through a machine associated with the photoelectric cell so that the original sounds are reproduced. By this means it would be possible to broadcast matter at times which might possibly be more convenient than that at which it was delivered.

A new pattern of the cathode ray oscillograph, which was first invented by Prof. Braun, has been designed by the Western Electric Company. It is provided with a heated cathode and contains a small amount of gas, which two factors makes it possible to operate the tube with the comparatively low anode potential of from 250 to 400 volts, and also brings to a focus, or rather eliminates the diffusion of, the cathode ray beam which occurs in the high vacuum form of cathode ray tube.

To prevent the cathode from being destroyed by the bombardment of the positive ions which are formed by the discharge it is formed in a nearly complete circle of a diameter just greater than the hole in a diaphragm which is placed just in front, and arranged so that the circle is parallel to the diaphragm. Under these conditions a life of about 200 hours is obtained. Two pairs of deflecting plates mutually at right angles are inserted inside the tube, and the fluorescent screen is coated with a mixture of equal parts of calcium tungstate and zinc silicate, both specially prepared. This mixture gives a luminous spot which is suitable for both visual and photographic purposes. Deflecting coils placed outside the tube may be used instead of the internal plates.

Dr. Phillips Thomas, of the Westinghouse Company, in America, has invented a microphone of a novel design. In it an electric glow-discharge takes place between two points separated by a short distance in air. Sound waves impinging on the gap alter the resistance, and the current variations thus caused are amplified in the usual manner.

Mr. E. B. Moullin has investigated the conditions necessary for employing a triode valve in the construction of a sensitive direct reading voltmeter, and as a result two forms of instrument have been developed. One is suitable for measuring an alternating potential even when associated with a direct potential and having a range of about six volts. The other type measures the total potential, and has a range of about $1\frac{1}{2}$ volts.

A very robust type of relay which can be employed for recording wireless received signals on a tape has been designed by Dr. N. W. McLachlan.

It consists essentially of an iron drum with an annular recess within which are placed one or more coils of wire, the ends of which are connected to slip rings, by which current may be led into them. Cast iron rings are fitted to the drum, and these are machined to run true to 0.0001 inch. A small iron or steel shoe fits the curvature of these rings very accurately. When the drum is magnetised by leading a current into the coils the shoe is attracted and adheres to it with considerable force. The drum, which is mounted on ball bearings, is rotated by a motor, so that when the shoe is attracted it tends to move with it, and a considerable force is required to cause it to slip over the surface of the rings of the drum. This force is utilized for actuating a siphon or other suitable form of inking device. It may also be employed for actuating relay contacts, etc.

The recorder has been employed for the automatic reception of messages on board ship, as is described elsewhere in this article, for which purpose the robustness and relatively large forces used to actuate the inking device render it especially appropriate.

Investigations.

SOME very important investigations on atmospherics have been published recently. Mr. R. A. Watson Watt has given the result of a Meteorological Office investigation of data obtained between April, 1916, and May, 1918, by the Admiralty coastal direction finding stations, from which it appears probable that rainfall is definitely associated with atmospherics.

Dr. E. V. Appleton and Mr. Watson Watt have recently published a paper in the "Proceedings of the Royal Society of London," in which is given the results of an investigation on atmospherics, in which the actual wave forms of a number of atmospherics have been traced by means of the cathode ray oscillograph, developed by the Western Electric Company, and described elsewhere in this article. The aerial employed to receive the atmospherics was rendered aperiodic by a series resistance of about 800 ohms, and the atmospherics are drawn from their trace shown on the fluorescent screen.

Dr. Appleton contributes an article on this subject elsewhere.

It is found that there are well-marked species of atmospherics, the principal being aperiodics in which the measured voltage does not reverse in sign, and quasi-periodics, in which one or more reversals of voltage occur. Each of these occur with peaked and rounded waveforms.

The aperiodic atmospherics more often produce an upward electromotive force in the aerial, those of the reverse voltage being only one-seventh as numerous on the first set of records to be classified. The quasi-periodic are about equally numerous for both voltage signs. The rounded forms are more than twice as numerous as the peaked ones, but the maximum voltage of the latter is, on the average, twice that of the others. The field strength of the atmospherics is large, being on the average, about $\frac{1}{8}$ -volt per metre.

An automatic recorder which gives the magnitude of the disturbance, its line of arrival and the direction from which it comes, has been installed at Aldershot for about eighteen months.

A frame aerial two metres square is driven by a clock and carries a record drum, on which the disturbances are recorded by a pen fitted to an Abraham-Bloch oscillograph.

By means of the records taken therewith and those obtained previously a considerable amount of data on the distribution of atmospherics for varying seasons has been accumulated.

A considerable amount of research work has been published during the past year. In a paper read before the Wireless Section of the Institution of Electrical Engineers, by Messrs. R. L. Smith-Rose and R. H. Barfield, experiments were described which provide quantitative data as regards the influence of metal work, aerials, overhead wires and trees, on a direction finding receiving set situated in the vicinity. Some data on the errors produced by mountainous country and buildings were also obtained.

The heating of receiving valve filaments from an alternating current source is very desirable to those whose supply is of this form, since it eliminates the cost of a charging set in the case of the many who do not look with favour on the accumulator or the manner in which it is often treated by those entrusted with the charging thereof. As is well known, most valve transmitting sets have their filaments heated by unrectified alternating current.

One method by which this can be accomplished has been described by Mr. P. D. Lowell in the Scientific Papers of the Bureau of Standards, U.S.A.

The circuit has three high frequency valves, a crystal rectifier and two low frequency valves, the substitution of the crystal for the usual valve detector reducing the A.C. hum considerably.

The A.C. voltage at 60 cycles is stepped down to 8 volts by a transformer. The filament side of the grid circuits are connected to the slider of a 200 ohm potentiometer shunted across the 8 volt line, a separate potentiometer being used for the high frequency and the low frequency valves. These grid circuits are not, however, connected directly to the potentiometers. For the high frequency valves a condenser of 0.02 mfd., shunted by 2 megohm resistances, is connected between the grid circuit and the potentiometer, whilst for the low frequency valves a 10-volt dry cell battery is used so that the grids are negative to the filaments. The high tension supply is obtained from a 300-volt winding on the same transformer, a 10 microfarad smoothing condenser shunting the terminals. The field current of a loud speaker is also supplied from a 110-volt winding with a rectifier in series.

A new type of valve which should have great possibilities for receiving work is that invented by Mr. H. P. Donle, of the Connecticut Telephone and Electric Company.

The valve is of the three-electrode type, but the anode is of metallic sodium and is warmed by a heater located outside the tube, which therefore is used in an inverted position to the usual. In place of a grid a "collector" electrode is formed by sheet metal bent into U form and placed so that the filament is on its axis. The heater for the anode is connected in series with the filament in order to utilise the same battery.

The collector is connected to one terminal of the usual tuned circuit, the other being connected to a potentiometer across the filament battery: since the adjustment of the collector potential is the principal one for efficient operation. The anode-filament circuit contains a high tension battery and telephones. The valve is used apparently only as a detector, and is stated to be as sensitive as an ordinary triode used with a regenerative circuit adjusted to the maximum possible retroaction short of oscillating.

RÉSUMÉ OF WIRELESS TELEGRAPHIC AND TELEPHONIC LEGISLATION

LEGISLATION relating to Wireless Telegraphy does not date back further than the year 1903, although four years earlier (in 1899) the Marconi system had reached a point of development sufficiently advanced for the British Admiralty to think it desirable to obtain sets of apparatus for trial, and two years later (in 1901) an agreement of a limited nature was entered into between the Admiralty and the Company for the supply of Marconi apparatus. In July, 1903, a further and more complete agreement was concluded. At that time the increasing use of Wireless Telegraphy for maritime purposes throughout the world had raised questions of international interest, and circumstances had clearly demonstrated that international agreement was desirable with regard to many points dealing with the interchange of messages through the newly established medium.

A conference met at Berlin in August, 1903, on the invitation of the German Government. As a result of that conference all the Powers, with the exception of Great Britain and Italy, agreed to certain proposals, to be considered at a subsequent conference, for the international regulation of Wireless Telegraphy.

The Wireless Telegraphy Act, which was passed in 1904 for two years only, and which was renewed in 1906 without modification (and is still in force), prohibits the installation or working of wireless telegraph apparatus in the United Kingdom, or on board British ships, except under licence from the Postmaster-General. Its principal objects were, by means of systematic regulations, to make Wireless Telegraphy more useful for purposes of defence and general communication. The memorandum which was laid before the House of Commons in explanation of the Bill stated that the necessity for legislation depended, firstly, on the importance from the naval point of view of giving the Government control over wireless stations in time of war or emergency; and, secondly, on the desirability of placing the Government in such a position as to have the power of entering into an agreement on the subject with other countries if it should be found expedient to do so.

In October, 1906, a second International Conference was held in Berlin, and its primary objects may be classified under the following headings:— (1) The acceptance and transmission of telegrams. (2) The adoption of rules of working. (3) The provision of means of collecting charges and settling accounts between the different countries. (4) Arrangements for the publication of all information necessary for inter-communication. (5) Rules to prevent interference and confusion in working, with adequate provisions for enforcement. (6) Provision that, with certain exceptions, inter-communication must not be refused on account of the differences in the systems of Wireless Telegraphy employed.

The documents signed at Berlin on November 3rd, 1906, consisted of:— (a) The Convention; (b) the Additional Undertaking; (c) the Final Protocol; (d) the Service Regulations. These documents were revised at the London Convention held in 1912, and the Radiotelegraphic Convention which came into operation on July 1st, 1913, is printed *in extenso* in the following pages. About 40 per cent. of the delegates present at the last conference were administrative, executive, or technical officials, acting for the postal telegraph

The signing of the International Convention for the safety of Life at Sea on January 20th, 1914, constituted a most noteworthy advance in the legislation relating to Wireless Telegraphy. The Convention was drawn up by an International Conference which met in London on November 12th, 1913, and laid down, *inter alia*, the minimum Wireless Telegraphy equipment to be carried by ships of different grades. For the purpose of defining the hours of service (*i.e.*, setting out the times when the various stations are to open for the receipt and transmission of messages) the Radiotelegraphic Convention, 1912, divided ship stations into three classes, but did not specify which vessels (by virtue of the services maintained on board) should be placed in the various classes. Under the provisions of the Safety of Life at Sea Convention which deal with Wireless Telegraphy, these classes are clearly defined.

REPORT OF THE WORK OF THE BERNE INTERNATIONAL BUREAU. 15th YEAR (1921).
ORGANISATION AND PERSONNEL.

THE RADIOTELEGRAPHIC CONVENTION OF LONDON

[illegible]

List of adhesions to the Convention of London—continued.

Chile	16th April, 1914.
China	1st September, 1920.
Columbia	25th August, 1914.
Cuba	16th January, 1918.
Denmark	14th February, 1913.
Danzig (Free Town of)	22nd June, 1921.
Egypt	1st February, 1913.
Ecuador	17th April, 1920.
Spain and Colonies	27th June, 1913.
U.S.A., including Alaska, Hawaii, Philippine Islands, Porto Rico and Possessions, Panama Canal Zone	21st February, 1913.
France and Algeria, including French Equatorial Africa, French West Africa, Tunis, Indo-China	17th February, 1914.
Madagascar—	
New Caledonia	19th February, 1915.
French Oceanic Establishments	3rd February, 1916.
Guadelope	10th January, 1917.
Martinique	13th February, 1917.
Great Britain,—	
including Union of South Africa, Australian Commonwealth, Dominion of Canada, British West Indies, New Zealand and the following protectorates: Barbados, Basutoland, Bermudes, British North Borneo, Ceylon, Cyprus, Gold Coast (and Ashanti), Malay States (Perak, Selangor, Negri-Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong-Kong, Bahama Islands, Windward Islands (Grenada, St Lucia, St. Vincent), Falkland Islands, Fiji Islands, Leeward Islands (Antigua, Montserrat, St. Kitts and Christopher, Dominica, Virgin Islands), Jamaica (Turques, and Caicos, Caymans Islands), Kenya, Malta, Mauritius, Northern Nigeria, Southern Nigeria, Western Pacific Possessions (Fanning Islands, Gilbert and Ellice Islands, British Solomon Islands), Bechuanaland Protectorate, Nyassaland Protectorate, Somaliland Protectorate, Northern Rhodesia, Southern Rhodesia, Seychelles Islands, Sierra Leone, St. Helena, Straits Settlements (Labouan, Cocos Islands), Swaziland, Trinidad and Tobago, Uganda, Weihaiwei	2nd June, 1913.
Zanzibar	14th July, 1913.
Norfolk Islands, Papeeti, Terre-Neuve	2nd June, 1913.
Sarawak	23rd April, 1914.
Tonga Islands	28th May, 1915.
Greece	24th July, 1914.
Guatemala	10th July, 1914.
Hungary	12th March, 1914.
Ireland	26th February, 1919.
Italy, including Italian Colonies and Possessions (Eritrea and Italian Somaliland)	18th June, 1913.
Italian Possessions in Cyrenaica and Tripolitana	13th January, 1914.
Japan, including Chosen, Formosa, Kwantung, Sakhalin	16th July, 1913.
Morocco, excepting the Spanish Zone	2nd November, 1914.
Mexico	6th October, 1913.
Monaco	10th December, 1912.
Norway	8th October, 1913.
New Hebrides	8th September, 1921.
Panama	14th July, 1914.
Holland, Netherland Indies and Colony of Curaçao	20th March, 1913.
Peru	12th July, 1915.
Persia	
Poland	7th January, 1921.
Portugal and Portuguese Colonies, including Portuguese Africa, Portuguese East Africa and Portuguese Asiatic Possessions	2nd December, 1913.
Roumania	27th June, 1913.
Russia and Russian Protectorates and Possessions, including Asiatic Central Russia, Boukhara, Khiva, Western Siberia, Eastern Siberia	5th April, 1923.
St. Marino	1st August, 1913.
Serbes, Croates and Slovenes	17th June, 1919.
Siam	30th May, 1913.
Sweden	30th May, 1913.
Czechoslovakia	23rd April, 1920.
Turkey	
Uruguay	29th February, 1916.
Venezuela	13th August, 1920.

The number of radiotelegraphic stations that the Bureau dealt with in 1921 was 14,821.

The work of the Bureau in circularising and maintaining the official lists of the countries Call Letters of the various wireless stations of the world is considerably increasing. In spite, however, of the extra work entailed in keeping this information up to date, the administration kept their expenses well below the allowance provided for in the Convention.

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

London, July 5th, 1912.

INTERNATIONAL Radiotelegraphic Convention concluded between Great Britain and various British Colonies and Protectorates,* Union of South Africa, Commonwealth of Australia, Canada, British India, New Zealand, Greece, Italy and Italian Colonies, Germany and Protectorates, United States of America and Possessions, Argentina, Austria, Hungary, Bosnia-Herzegovina, Belgium, Belgian Congo, Brazil, Bulgaria, Chili, Denmark, Egypt, France and Algeria, French West Africa, French Equatorial Africa, Greece, Indo-China, Madagascar, Tunis, Japan and Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Morocco, Monaco, Norway, Netherlands, Dutch Indies, Curaçoa, Persia, Portugal and Portuguese Colonies, Roumania, Russia and Russian Possessions and Protectorates, San Marino, Siam, Spain and Spanish Colonies, Sweden, Turkey and Uruguay.

The undersigned Plenipotentiaries of the Governments of the countries enumerated above, being assembled in Conference in London, have, by mutual consent, and subject to ratification, concluded the following Convention :—

ARTICLE 1.

Application of Provisions.

The High Contracting Parties undertake to apply the provisions of the present Convention at all the radiotelegraph stations (coast stations and ship stations) which are established or worked by the Contracting Parties and open for the service of public correspondence between the land and ships at sea.

They undertake, moreover to impose the observance of these provisions upon private enterprises authorised either to establish or to work radiotelegraphic coast stations open to the service of public correspondence between the land and ships at sea, or to establish or to work radiotelegraphic stations whether open for public correspondence or not on board the ships which carry their flag.

ARTICLE 2.

Interpretation of Terms.

The term coast station means radiotelegraphic station established on land or on board any ship permanently anchored and used for the exchange of correspondence with ships at sea.

The term ship station means any radiotelegraphic station established on board a ship other than a permanently moored ship.

ARTICLE 3.

Compulsory Interchange of Messages.

Coast stations and ship stations are bound to exchange radiotelegrams reciprocally without regard to the radiotelegraph system adopted by such stations.

Each ship station is bound to exchange radiotelegrams with any other ship station without distinction as to radiotelegraphic system adopted by such stations.

Nevertheless, in order not to impede scientific progress, the provisions of the present Article do not prevent the contingent employment of a radiotelegraphic system incapable of communicating with other systems, provided that such incapacity be due to the specific nature of such system and that it be not caused by devices adopted solely with the object of preventing inter-communication.

ARTICLE 4.

Restriction of Service.

Notwithstanding the provisions of Article 13, a station may be appropriated to a restricted public service determined by the object of the correspondence or by other circumstances independent of the system employed.

ARTICLE 5.

Connection with Land Telegraph System.

Each of the High Contracting Parties undertakes to cause the coast stations to be connected with the telegraph system by means of special wires, or at least, to take such other measures as will ensure a rapid exchange between the coast stations and the telegraph system.

ARTICLE 6.

Notification of Particulars.

The High Contracting Parties shall mutually notify one another of the names of the coast stations and ship stations covered by Article 1

* Barbados, Basutoland, Bermudas, Borneo, Ceylon, Cyprus, Gold Coast and Ashanti, Malay States (Perak, Selangor, Negri Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong Kong, Bahama Islands, Windward Islands (Grenada, St. Lucia, St. Vincent), Falkland Islands, Fiji Islands, Jamaica, Turks and Caicos Islands, Cayman Islands, Leeward Islands (Antigua, Montserrat, St. Kitts-Nevis, Dominica, Virgin Islands), Malta, Mauritius, Northern and Southern Nigeria, Western Pacific Islands (Fanning Island, Gilbert and Ellice Islands, British Solomon Islands), East African Protectorate, Uganda, Bechuanaland, Nyassaland, British Somaliland, Northern and Southern Rhodesia, Seychelles, Sierra Leone, St. Helena, Straits Settlements (Labuan, Cocos Islands), Swaziland, Trinidad and Tobago, Wei-hai-wei.

as well as of all the particulars necessary to facilitate and accelerate the radiotelegraphic exchanges, as specified in the Detailed Regulations.

ARTICLE 7.

Other Radiotelegraphic Arrangements.

Each of the High Contracting Parties reserves to itself the right to prescribe or to permit in the stations covered by Article 1— independently of the installation of which the particulars are published conformable to Article 6—the installation and working of other arrangements designed for special radiotelegraphic transmission without publication of the details of such devices.

ARTICLE 8.

Interference with Other Stations.

The working of radiotelegraphic stations shall be organised as far as possible in such a manner as not to interfere with the working of other stations of the kind.

ARTICLE 9.

Distress Calls.

Radiotelegraphic stations shall be obliged to accept with absolute priority calls of distress from whatever source, to reply in like manner to such calls, and to give the effect to them which they require.

ARTICLE 10.

Charges.

The charge for a radiotelegram shall include according to the circumstances:—

1. (a) The "coast charge" which accrues to the coast station.

(b) The "ship charge" which accrues to the ship station.

2. The charge for transmission over the lines of the telegraph system, calculated in accordance with the ordinary rules.

3. The transit charges of the intermediate coast or ship stations and the charges appertaining to special services required by the sender.

The rate of the coast charge shall be subject to the approval of the Government to whose authority the coast station is subject, and the rate of the ship charge to the approval of the Government to which the ship belongs.

ARTICLE 11.

Validity and Modifications.

The provisions of the present Convention are completed by Detailed Regulations which have the same validity and come into force at the same time as the Convention.

The provisions of the present Convention and of the Regulations relating thereto may be modified at any time by mutual consent of the High Contracting Parties. Conferences of Plenipotentiaries having power to modify the Convention and the Regulations shall take place periodically; each Conference shall itself fix the place and time of the succeeding Conference.

ARTICLE 12.

Exercise of Voting Powers.

These Conferences shall be composed of Delegates of the Governments of the Contracting Parties.

In the deliberations each country shall have one vote only.

If a Government adhere to the Convention or its colonies, possessions or protectorates, subsequent Conferences may determine that the whole or part of such colonies, possessions or protectorates is to be regarded as forming a country for the purposes of the foregoing clauses. But the number of votes to be exercised by a Government, including its colonies, possessions or protectorates, may not exceed six.

The following are regarded as forming a single country for the purposes of the present Article:—

The Union of South Africa.

The Australian Commonwealth.

Canada.

British India.

New Zealand.

Ex-German East Africa.

Ex-German South-West Africa.

The Cameroons.

Togoland.

The Ex-German Pacific Protectorates.

Alaska.

Hawaii and the other American possessions in Polynesia.

The Philippine Islands.

Porto Rico and the American possession in the Antilles.

The zone of the Panama Canal.

The Belgian Congo.

The Spanish Colony of the Gulf of Guinea.

French West Africa.

French Equatorial Africa.

Indo-China.

Madagascar.

Tunisia.

Eritrea.

Italian Somaliland.

Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung.

The Dutch Indies.

The Colony of Curaçao.

Portuguese West Africa.

Portuguese East Africa and the Portuguese possession in Asia.

Russian Central Asia (littoral of the Caspian Sea.)

Bokhara.

Khiva.

Western Siberia (littoral of the Arctic Ocean)

Eastern Siberia (littoral of the Pacific Ocean)

ARTICLE 13.

Collection of Information.

The International Bureau of the Telegraph Union shall be entrusted with the duty of collecting, co-ordinating, and publishing information of every kind relating to radiotelegraphy; of circulating in proper form proposals for the modification of the Convention and of the Regulations: of notifying the changes adopted, and, generally, of carrying out any Administrative work which it may be called upon to undertake in the interests of International Radiotelegraphy.

The expenses of this institution shall be borne by all the Contracting Parties.

ARTICLE 14.

Conditions of Transmission and Receipt.

Each of the High Contracting Parties reserves to itself the right to fix the conditions under which it will admit radiotelegrams coming from or destined for a station, whether a ship station or a coast station, which is not subject to the provisions of the present Convention.

If a radiotelegram is admitted, the ordinary charges must be applied to it.

Every radiotelegram originating at a ship station and received by a coast station of the contracting country, or accepted in transit by the Administration of a contracting country shall be sent forward.

Every radiotelegram intended for a ship shall also be sent forward if the Administration of the contracting country has accepted it from the sender, or if the Administration of a contracting country has accepted it in transit from a non-contracting country, subject to the right of the coast station to refuse transmission to a ship station belonging to a non-contracting country.

ARTICLE 15.

Further Applications.

The provisions of the Articles 8 and 9 of this Convention are equally applicable to radiotelegraphic installations other than those indicated in Article 1.

ARTICLE 16.

Admission of New parties.

Governments which have not taken part in the present Convention shall be allowed to become party to it at their own request.

Such adherence shall be notified through diplomatic channels to that one of the contracting Governments in whose territory the last Conference was held and by that Government to the others.

Such adherence shall involve complete acceptance of all the clauses of the present Convention and admission to all the advantages stipulated therein.

The adherence to the Convention of the Government of a country having colonies, possessions, or protectorates shall not carry with it the adherence of the colonies, possessions, or protectorates of such Government, unless a declaration be made to that effect by such Government. These colonies, possessions, or protectorates as a whole, or each one of them separately, may form the subject of a separate adherence or of a separate denunciation under the conditions indicated in the present Article and in Article 22.

ARTICLE 17.

Application of International Telegraph Convention of 1875.

The provisions of Articles 1, 2, 3, 5, 6, 7, 8, 11, 12, and 17, of the International Telegraph Convention of St. Petersburg (Petrograd) dated 10/22 July, 1875, shall be applicable to International Radiotelegraphy.

ARTICLE 18.

Arbitration.

In cases of difference of opinion between two or more contracting Governments concerning the interpretation or the execution either of the present Convention or of the Regulations provided for by Article 11, the question at issue may, by mutual consent, be submitted to arbitration. In that event each of the Governments concerned shall choose another not interested in the question.

The decision of the Arbitrators shall be made by an absolute majority of votes.

In the event of an equality of votes, the Arbitrators shall appoint, in order to settle the difficulty, another Contracting Government not concerned in the question in dispute. In default of an agreement with regard to such

choice, each Arbitrator shall propose a Contracting Government not interested in the dispute; and lots shall be drawn as between the Governments proposed. The drawing of lots shall be the prerogative of the Government in whose territory the International Bureau provided for in Article 13 performs its work.

ARTICLE 19.

Legislative Measures.

The High Contracting Parties undertake to adopt or to propose to their respective legislatures the measures necessary to ensure the execution of the present Convention.

ARTICLE 20.

Communication between Contracting Parties.

The High Contracting Powers shall communicate to one another such laws as may have been already enacted or which may be about to be so enacted in their countries, relating to the subject of the present Convention.

ARTICLE 21.

Freedom of Action.

The High Contracting Parties maintain their entire liberty concerning the radiotelegraphic installation not covered by Article 1, and particularly with regard to naval and military installations, and also to stations carrying out communications between fixed points. All such installations and stations shall remain subject solely to the obligations provided for in Articles 8 and 9 of the present Convention.

Nevertheless, when these installations and stations carry out an exchange of maritime public correspondence, they shall conform, in carrying out such service, to the requirements of the Regulations so far as concerns the method of transmission and accounting.

If, on the other hand, coast stations carry out, at the same time as public correspondence with ships at sea, communications between fixed points, they shall not be subject, in the execution of this latter service, to the provisions of the Convention, except as to the observance of Articles 8 and 9 of this Convention.

However, fixed stations which carry out correspondence between land and land must not refuse the exchange of radiotelegrams with another fixed station on account of the system adopted by such station; nevertheless, the liberty of each country shall remain complete in respect of the organisation of the service for correspondence between fixed points and the decision as to the correspondence to be carried out by the stations appropriated to such service.

ARTICLE 22.

Date of Operation.

The present Convention shall come into execution on and from the 1st July, 1913, and shall remain in force for an indeterminate period and until the expiry of one year from the day upon which it is denounced.

Denunciation shall only take effect as regards the Government in whose name it is made. So far as the other Contracting Parties are concerned, the convention shall remain in force.

ARTICLE 23.

Ratification.

The present Convention shall be ratified, and the ratification thereof shall be deposited in London with as little delay as possible.

If one or more of the High Contracting Parties shall not ratify the Convention, it shall not be less valid thereby for the parties which have ratified it.

In witness whereof the respective Plenipotentiaries have signed the Convention in a single copy, which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each Party.

London, the 5th of July, 1922.

FINAL PROTOCOL

At the time of proceeding to the signature of the Convention adopted by the International Radiotelegraphic Conference of London, the undersigned Plenipotentiaries have agreed as follows:—

I.

The exact nature of the adherence notified on the part of Bosnia-Herzegovina not being yet determined, it is recognised that Bosnia-Herzegovina is entitled to a vote, a decision at a later date being necessary on the question whether this vote belongs to Bosnia-Herzegovina in virtue of the second paragraph of Article 12 of the Convention, or whether this vote is accorded to it conformably to the provisions of the third paragraph of that Article.

II.

The following declaration is placed on record:—

The Delegation of the United States declares that its Government is under the necessity of abstaining from all action with regard to tariffs, because the transmission of radiotelegrams as well as of telegrams in the United States is undertaken, wholly or in part, by commercial or private companies.

III.

The following declaration was also placed on record:—

The Government of Canada reserves to itself the right to fix separately, for each of its coast stations, a total sea charge for radiotelegrams originating from North America and intended for any ship whatever, the coast charge amounting to three-fifths and the ship charge to two-fifths of such total charge.

In witness whereof the respective Plenipotentiaries have drawn up the present Final Protocol, which shall have the same force and the same validity as if the provisions thereof had been inserted in the text itself of the Convention to which it belongs, and they have signed it in a single copy which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each party.

London, the 5th of July, 1912.

SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

CONTENTS.

1. Organisation of radiotelegraphic stations.
2. Hours of service of stations.
3. Form and acceptance of radiotelegrams.
4. Charges.
5. Collection of charges.
6. Transmission of radiotelegrams:—
 - (a) Signals of transmission.
 - (b) Order of transmission.
 - (c) Calling of stations and transmission of radiotelegrams.
 - (d) Acknowledgment of receipt and end of work.
 - (e) Route to be followed by radiotelegrams.
7. Delivery of radiotelegrams.
8. Special radiotelegrams.
9. Records.
10. Refunds and reimbursements.
11. Accounting.
12. International Bureau.
13. Meteorological, time, and other transmissions.
14. Miscellaneous provisions.

I.—ORGANISATION OF RADIO-TELEGRAPHIC STATIONS

I.

Choice of Apparatus.

The choice of radiotelegraphic apparatus and devices to be used by coast stations and ship stations is free. The installation of these stations must, as far as possible, be in keeping with scientific and technical progress.

11.

Wavelength.

Two wavelengths, one of 600 and the other of 300 metres, shall be admitted for the service of general public correspondence. Every coast station open to this service must be equipped in such a way as to be able to use these two wavelengths, of which one shall be designated as the normal wavelength of a station. During the whole time that it is open

every coast station must be in a position to receive calls made by means of its normal wavelength. Nevertheless, for the correspondence covered by paragraph 2 of Regulation XXXV, use shall be made of a wavelength of 1,800 metres. Further, each Government may authorise the use, in a coast station, of other wavelengths for the purpose of securing a long-range service or a service other than that of general public correspondence, and established in conformity with the provisions of the Convention, with the reservation that the wavelengths do not exceed 600 metres, or that they do exceed 1,600 metres.

In particular, stations used exclusively for the despatch of signals intended to determine the position of ships must not use wavelengths exceeding 150 metres.

III.

Equipment.

1. Every ship station must be equipped in such a way as to be able to use the wavelengths of 600 metres and of 300 metres. The first shall be the normal wavelength, and may not be exceeded in transmission, the case of Regulation XXXV (paragraph 2) excepted.

Use may be made of other wavelengths not exceeding 600 metres in special cases, and subject to the approval of the Administrations to which the coast stations and ship stations concerned are subject.

2. During the whole time that it is open every ship station must be able to receive calls made by means of its normal wavelength.

3. Ships of small tonnage, in the case of which it would be materially impossible to use the wavelength of 600 metres for transmission, may be authorised to employ exclusively the wavelength of 300 metres; they must be able to receive by means of the wavelength of 600 metres.

IV.

Communication.

Communications between a coast station and a ship station, or between two ship stations, must be exchanged on both sides by means of the same wavelength. If, in a particular case, communication is difficult, the two stations may, by mutual consent, pass from the wavelength by means of which they are communicating to the other regulation wavelength. Both stations shall resume their normal wavelengths when the radiotelegraphic exchange is finished.

V.

Map and Nomenclature.

1. The International Bureau shall prepare, publish and revise periodically an official map showing the coast stations, their normal ranges, the principal lines of navigation, and the time normally taken by ships for the voyage between the various ports of call.

2. It shall draw up and publish a Nomenclature of the radiotelegraphic stations covered by Article 1 of the Convention, and also periodical supplements for additions and modifications. This Nomenclature shall give, in the case of each station, the following information:—

1st.—For coast stations: the name, nationality, and geographical position indicated by the territorial subdivision and by the longitude and latitude of the place; for ship stations: the name and nationality of the ships; when the case arises, the name and address of the contractor.

2nd.—The call signal. (The call signals must be differentiated from one another, and each one must consist of a group of three letters.)

3rd.—The normal range.

4th.—The radiotelegraphic system with the characteristics of the system of discharge (musical sparks, tone expressed by the number of double vibrations, etc.).

5th.—The wavelengths used (the normal wavelength to be underlined.)

6th.—The nature of the services performed.

7th.—The hours of working.

8th.—When necessary the hour and method of despatch of time signals and meteorological telegrams.

9th.—The coast or ship charge.

3. There shall also be included in the Nomenclature such information relating to radiotelegraphic stations other than those covered by Article 1 of the Convention, as shall be communicated to the International Bureau by the Administrations to which such stations are subject, provided that these are either Administrations which are parties to the Convention, or, if they are not parties to it, have made the declaration provided for in Regulation XLVIII.

4. The following notations shall be adopted in documents for the use of the international service to designate radiotelegraph stations:—

PG—Station open for general public correspondence.

PR—Station open for restricted public correspondence.

P—Private station.

O—Station open only for official correspondence.

N—Station always open.

X—Station not having fixed working hours.

5. The name of a ship station indicated in the first column of the Nomenclature must be followed, when there is duplication of the name, by the call signal of such station.

VI.

Experiments and Practice.

The exchange of unnecessary signals and words is forbidden to the stations covered by Article 1 of the Convention. Experiments and practice shall not be allowed in these stations, except so far as they do not disturb the service of other stations.

Practice must be carried out with wavelengths different from those allowed for public correspondence, and with the minimum of power necessary.

VII.

Compulsory Conditions.

1. All stations are bound to exchange traffic with the minimum of energy necessary to ensure good communication.

2. Every coast and ship station must comply with the following conditions:—

(a) The waves emitted must be as pure and as little damped as possible.

In particular, the use of transmitting devices in which the production of the waves emitted is obtained by discharging the aerial direct by sparks (plain aerial) shall not be allowed except in cases of distress.

It may, however, be allowed in the case of certain special stations (for example, those of small ships) in which the primary power does not exceed 50 watts.

(b) The apparatus must be capable of transmitting and receiving at a speed at least equal

to 20 words per minute, the word being reckoned at the rate of five letters.

New installations bringing into play an energy of more than 50 watts shall be equipped in such a way that it may be possible to obtain easily several ranges less than the normal range, the shortest being of approximately 15 nautical miles. Installations already established bringing into play an energy of more than 50 watts shall be transformed as far as possible in such a manner as to satisfy the foregoing requirements.

(c) Receiving apparatus must allow of receiving, with the greatest possible amount of protection from disturbance, transmissions made with the wavelengths specified in present Regulations, up to 600 metres.

3. Stations serving solely for determining the position of ships (*radiophares*) must not operate over an area of greater radius than 30 nautical miles.

VIII.

Power.

Independently of the general conditions specified in Regulation VII, ship stations must also satisfy the following conditions:—

(a) The power transmitted to the radiotelegraphic apparatus, measured at the terminals of the generator of the station, must not under normal circumstances exceed one kilowatt.

(b) Subject to the provisions of Regulation XXXV, par. 2, a power exceeding one kilowatt may be used if the ship is under the necessity of corresponding at a distance of more than 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be realised except by means of an increase of power.

IX.

Licences.

1. No ship station may be established or worked by private enterprise without a licence issued by the Government to which the ship is subject.

Stations on board ship having their port of register in a colony, possession, or protectorate may be described as being subject to the authority of such colony, possession, or protectorate.

2. Every ship station holding a licence issued by one of the contracting Governments must be regarded by the other Governments as having an installation fulfilling the conditions imposed by the present Regulations.

The competent authorities of the countries where the ship calls may demand the production of the licence. In default of such production, these authorities may ascertain whether the radiotelegraph installations of the ship satisfy the conditions imposed by the present Regulations.

When an Administration has practical evidence that a ship station is not fulfilling these conditions, it must, in every case, address a complaint to the Administration of the country to which the ship is subject. From that point onwards the procedure shall be, when necessary, as provided in Regulation XII, paragraph 2.

X.

Certificates.

1. The service of the ship station must be carried out by a telegraphist holding a certificate issued by the Government to which the

ship is subject, or, in an emergency and for one voyage only, by another Government party to the convention.

2. There shall be two classes of certificates:—

The first-class certificate shall state the professional qualifications of the operator with regard to:—

(a) the adjustment of the apparatus and knowledge of their working;

(b) transmitting and receiving by ear, at a speed which must not be less than 20 words per minute;

(c) knowledge of the regulations applying to the exchange of radiotelegraphic communications.

The second-class certificate may be issued to a telegraphist who only attains to a speed in transmitting and receiving of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Telegraphists holding a second-class certificate may be allowed:—

(a) on ships only using radiotelegraphy for their own service and for the correspondence of the ship's company, in particular on fishing vessels;

(b) on all ships as substitutes, provided that such ships have on board at least one operator holding a first-class certificate. Nevertheless, on ships placed in the first class indicated in Regulation XIII, the service must be carried out by at least two telegraphists holding first-class certificates.

In ship stations, transmissions may only be made by a telegraphist holding a first or second-class certificate, an exception being made in cases of emergency, in which it would be impossible to conform to this provision.

3. Further, the certificate shall testify that the Government has placed the telegraphist under the obligation of preserving the secrecy of correspondence.

4. The radiotelegraph service of the ship station shall be placed under the supreme authority of the captain of the ship.

XI.

Emergency Equipment.

Ships provided with radiotelegraph installations and placed in the first two classes indicated in Regulation XIII shall be bound to have emergency radiotelegraph installations of which all the parts shall be placed in conditions of the greatest safety possible, such conditions to be determined by the Government which issues the licence. These emergency installations must have at command a source of power of their own, must be capable of being set working speedily, must be able to work for six hours at least, and must have a minimum range of 80 nautical miles in the case of ships in the first class, and of 50 miles in the case of those of the second class. This emergency installation shall not be required in the case of ships whose ordinary installation fulfils the conditions of the present article.

XII.

Responsibility for Breach of the Convention.

1. If an Administration has information of a breach of the Convention or of the Regulations committed in one of the stations which it has authorised, it shall ascertain the facts and fix the responsibility.

In the case of ship stations, if the responsibility rests on the operator, the Administration shall take the necessary steps, and, if necessary, shall withdraw the certificate. If it is shown that the breach was due to the condition of the

apparatus or to instructions given to the telegraphist, the same procedure shall be followed in respect of the licence issued to the ship.

2. In the event of repeated breaches by the same ship, if the representations made to the Administration to which the ship is subject, by another Administration, remain without effect, the latter shall have the right, after notice given, of authorising its coast stations not to accept communications coming from the ship in question. In case of a difference between the two Administrations the questions shall be submitted to arbitration on the request of one of the Governments concerned. The procedure is indicated in Article XVIII of the Convention.

II.—HOURS OF SERVICE OF STATIONS.

XIII.

Land and Ship Stations.

a) Coast Stations.

1. The service of coast stations shall be, as far as possible, permanent, day and night, without interruptions.

Nevertheless, certain coast stations may have a service of limited duration. Each Administration shall fix the hours of service.

2. Coast stations whose service is not permanent may not close before having transmitted all their radiotelegrams to the ships which are in their radius of action nor before having received from such ships all the radiotelegrams of which notice has been given. This provision shall also apply when ships notify their presence before work has actually ceased.

(b) Ship Stations.

3. Ship stations shall be placed in three classes:—

(1st) Stations always open;

(2nd) Stations having limited working hours;

(3rd) Stations having no fixed working hours.

During navigation, the following must remain permanently on the watch: (1st) ships of the first class; (2nd) those of the second class, during the hours that they are open for service; out of these hours, the latter stations must remain on the watch for the first 10 minutes of each hour. The stations of the third class are not bound to perform any regular "listening" service.

It shall fall to the Governments which issue the licences specified in Article IX to fix the class in which the ship is to be placed, in respect of its obligations in the matter of keeping watch. This classification shall be mentioned in the licence.

III.—DRAWING UP AND HANDING IN OF RADIO-TELEGRAMS.

XIV.

Transmission from Ship to Land.

1. Radiotelegrams shall bear, as the first word of the preamble, the service instructions "radio."

2. In the transmission of radiotelegrams coming from a ship at sea, the date and the hour of the handing in at the ship station shall be indicated in the preamble.

3. On forwarding over the telegraph system, the coast station shall insert as the indication

of the office of origin, the name of the ship of origin as it appears in the Nomenclature, and also, when the case arises, that of the last ship which served as an intermediary. These particulars shall be followed by the name of the coast station.

XV.

Transmission from Land to Ship.

1. The address of radiotelegrams intended for ships must be as complete as possible. It shall be compulsorily drawn up as follows:—

(a) Name or title of the addressee, with supplementary particulars if necessary.

(b) Name of the ship, as it appears in the first column of the nomenclature.

(c) Name of the coast station, as it appears in the nomenclature.

Nevertheless the name of the ship may be replaced, at the risks and perils of the sender, by the particulars of the voyage taken by such ship and determined by the names of the ports of origin and destination or by any other equivalent particulars.

2. In the address, the name of the ship, as it appears in the first column of the nomenclature, shall be counted in every case, and independently of its length, as one word.

3. Radiotelegrams drawn up by means of the International Signal Code shall be forwarded to their destination without being de-coded.

IV.—CHARGES.

XVI.

Coast and Ship Charges.

1. The coast charge and the ship charge shall be fixed in accordance with the tariff per word pure and simple, on the basis of a fair remuneration for radiotelegraphic work, with optional application of a minimum charge per radiotelegram.

The coast charge may not exceed 60 centimes per word, nor the ship charge 40 centimes per word. Nevertheless each Administration shall have the right to authorise coast and ship charges higher than these maxima in the case of stations having a range of more than 400 nautical miles, or of stations exceptionally onerous on account of the material conditions of their installation or working.

The optional minimum charge per radio telegram may not exceed the coast or ship charge for a radiotelegram of 10 words.

2. In the case of radiotelegrams originating from or intended for a country or exchanged directly with the coast stations of that country, the charge applying to the transmission over the lines of the telegraph system must not exceed, on the average, that of the inland rate of that country.

This charge shall be reckoned per word pure and simple, with an optional minimum charge not exceeding the charge for 10 words. It shall be notified in francs by the Administration of the country to which the coast station is subject.

In the case of countries in the European system, with the exception of Russia and Turkey, there shall only be a single charge for the territory of each country.

XVII.

Retransmission.

1. When a radiotelegram originating from a ship and intended for *terra firma* passes through one or more ship stations, the charge shall include, in addition to those of the ship of

origin, the coast station, and the telegraph system, the ship charge of each of the ships taking part in the transmission.

2. The sender of a radiotelegram originating from *terra firma* and intended for a ship may require that his message be transmitted by way of one or two ship stations; he shall deposit for this purpose the amount of the radiotelegraphic and telegraphic charges, and besides, as a deposit, a sum to be fixed by the office of origin with a view to the payment to the intermediate ship stations of the transit charges fixed in paragraph 1; he must further pay, as he may choose, either the charge for a telegram of five words or the cost of postage of a letter to be sent by the coast station to the office of origin giving the information necessary to the liquidation of the sum deposited.

The radiotelegram shall then be accepted at the risks and perils of the sender; it shall bear before the address the paid additional particulars "x retransmission telegraphie" or "x retransmission lettre" (x representing the number of retransmissions required by the sender) accordingly as the sender desires that the information necessary for the liquidation of the deposit be furnished by telegram or by letter.

3. The charge for radiotelegrams originating from a ship, intended for another ship, and sent by way of one or two intermediate coast stations, shall include:—

The ship charges of both ships, the charge of the coast station or the two coast stations, as the case may be, and when necessary the telegraph charge appropriate to the transit between the two coast stations.

4. The charge for radiotelegrams exchanged between ships without the aid of a coast station includes the ship charges of the ship of origin and of the ship of destination, with the ship charges of the intermediate stations added thereto.

5. The coast and ship charged due to the stations of transit shall be the same as those fixed for such stations when these are stations of origin and destination. In no case shall they be collected more than once.

6. In the case of any intermediate coast station, the charge to be collected for the transit service shall be the highest of the coast charges appertaining to the direct exchange with the two ships in question.

XVIII.

Origin of Telegrams.

The country in whose territory is established a coast station acting as intermediary for the exchange of radiotelegrams between a ship station and another country shall be regarded, for the purpose of applying telegraphic charges, as the country of origin or of destination of such radiotelegrams and not as the country of transit.

V.—COLLECTION OF CHARGES.

XIX.

Tariffs.

1. The total charge for radiotelegrams shall be collected from the sender, with the exception—1st, of the cost of express delivery (Article LVIII, paragraph 1, of the Telegraph Regulations); 2nd, of the charges applying to inadmissible joinings or alterations of words noted by the office or station of destination

(Article XIX, paragraph 9, of the Telegraph Regulations), these charges being collected from the addressee.

Ship stations must possess the necessary tariffs for this purpose. They shall have, however, the right to obtain information from coast stations with regard to charges for radiotelegrams for which they do not possess all the necessary information.

2. The counting of words by the office of origin shall be decisive in the case of radiotelegrams addressed to ships, and that of the ship station of origin shall be decisive in the case of radiotelegrams originating in ships, both for the purpose of transmission and for that of the international accounts. Nevertheless when the radiotelegram is worded wholly or in part either in one of the languages of the country of destination, in the case of radiotelegrams originating in ships, or in one of the languages of the country to which the ship belongs, in the case of radiotelegrams addressed to ships, and when the radiotelegram contains joinings or alterations of words contrary to the common use of that language, the office or ship station of destination, as the case may be, shall have the right to recover from the addressee the amount of the charge not collected. In the case of a refusal to pay the radiotelegram may be withheld.

VI.—TRANSMISSION OF RADIOTELEGRAMS.

(A) SIGNALS OF TRANSMISSION.

XX.

Code.

The signals employed shall be those of the International Morse Code.

XXI.

Distress Signals.

Ships in distress shall make use of the following signal.

• • • — — — • • •

repeated at short intervals, followed by the necessary particulars.

As soon as a station hears the signal of distress, it must suspend all correspondence and must not resume the same until after it has made sure that the communication consequent upon the call for help is finished.

The stations that hear a call of distress must act according to indication given by the ship which makes the call, with regard to the order of messages or their cessation.

When, at the end of a series of distress calls, there is added the call signal of the particular station, the reply to the call is proper to that station only, unless that station does not reply. Failing the indication of a particular station in the call for help, every station that hears the call shall be bound to reply thereto.

XXII.

Information.

For the purpose of giving or asking information concerning the radiotelegraph service, stations must make use of the signals contained in the list appended to the present Regulations. (See Code Section.)

(B) ORDER OF TRANSMISSION.

XXIII.

Duration of Transmission.

Between two stations, radiotelegrams of the same class shall be transmitted singly n

alternate order or by series of several radiotelegrams, according to the instructions given by the coast station, on condition that the duration of the transmission of each series does not exceed 15 minutes.

(c) CALLING OF STATIONS AND TRANSMISSION OF RADIOTELEGRAMS.

XXIV.

Calls.

1. As a general rule, it shall be the ship station that calls the coast station, whether it has radiotelegrams to transmit or not.

2. In waters where the radiotelegraphic traffic is congested (the Channel, etc.), the call of a ship to a coast station may not, as a general rule, be made unless the latter is within the normal range of the ship station and the ship station has approached to a distance less than 75 per cent. of the normal range of the coast station.

3. Before proceeding to make a call, the coast station or the ship station must adjust its receiving system to the highest possible degree of sensitiveness, and must make sure that no other communication is being made within its radius of action; if it is otherwise, it shall await the first break, unless it finds that its call is not likely to disturb the communication in progress. The same applies when the station wishes to answer a call.

4. For making a call every station shall use the normal wave of the station to be called.

5. If, in spite of these precautions, a radiotelegraphic transmission be impeded, the call must cease on the first request made by a coast station open to public correspondence. This station must then indicate the approximate duration of the wait.

6. The ship station must make known to each coast station to which it has notified its presence the time at which it proposes to cease its operations, and also the probable duration of the interruption.

XXV.

Call Signals.

1. The call comprises the signal — • • • —, the call signal of the station called, sent three times, and the word "de," followed by the call signal of the sending station, sent three times.

2. The station called shall reply by giving the signal — • • • —, followed by the call signal sent three times, of the calling station by the word "de," its own call signal and the signal — • • • —

3. Stations who wish to enter into communication with ships, without, however, knowing the names of those ships which are within their radius of action, may use the signal — • • • — (signal of enquiry). The provisions of paragraphs 1 and 2 are also applicable to the transmission of the signal of enquiry and to the reply to that signal.

XXVI.

Station Failing to Reply.

If a station when called does not reply when the call (Regulation XXV) has been sent three times at intervals of 2 minutes, the call may not be resumed until after an interval of 15 minutes, the station making the call first making sure of the fact that no radiotelegraphic communication is in progress.

XXVII.

Use of High Power.

Every station which has to make a transmission necessitating the use of high power shall first send out three times the warning

signal — • • • —, with the minimum of power necessary to reach the neighbouring stations. It shall not then begin to transmit with the high power until 30 seconds after sending the warning signal.

XXVIII.

Particulars regarding Reception.

1. As soon as the coast station has replied, the ship station shall furnish it with the following information if it has messages to transmit to it; this information shall also be given when the coast stations ask for it:—

(a) The approximate distance, in nautical miles, of the vessel from the coast station;

(b) The position of the ship given in a concise form and adapted to the circumstances of the individual case;

(c) The next port at which the ship will touch;

(d) The number of radiotelegrams if they are of normal length or the number of words if the messages are of exceptional length.

The speed of the ship in nautical miles shall be given specially at the express request of the coast station.

2. The coast station shall reply giving, as provided in paragraph 1, either the number of telegrams or the number of words to be transmitted to the ship and also the order of transmission.

3. If transmission cannot take place immediately the coast station shall inform the ship station of the approximate length of the wait.

4. If a ship station when called cannot receive for the moment it shall inform the calling station of the approximate length of the wait.

5. In the case of exchanges between two ship stations it shall rest with the station called to fix the order of transmission.

XXIX.

Exchange of Messages.

When a coast station is called by several ship stations, it shall decide the order in which these stations shall be allowed to exchange their messages.

In the regulation of this order, the coast station shall be guided solely by the necessity for allowing every station concerned to exchange the greatest possible number of radiotelegrams.

XXX.

Order of Transmission.

Before beginning to exchange correspondence the coast station shall inform the ship station whether the transmission is to be made in alternate order by series (Regulation XXIII); it shall then begin to transmit, or shall follow up these instructions by the signal — • • • —

XXXI.

Initial and Final Signals.

The transmission of a radiotelegram shall be preceded by the signal — • • • — and ended by the signal • • • — followed by the call signal of the sending station and by the signal — • • • —

In the case of a series of radiotelegrams, the call-letter of the sending station and the signal — • • • — shall only be given at the end of the series.

XXXII.

Lengthy Messages.

When the radiotelegram to be transmitted contains more than 40 words, the sending

station shall interrupt the transmission by the signal • • — • • after each series of 20 words or thereabouts, and it shall not resume transmission until after having obtained from the station in correspondence the repetition of the last word clearly received, followed by the said signal, or, if the reception is clear, the signal — • —

In the case of transmission in series, the acknowledgment of receipt shall be given after each radiotelegram.

Coast stations engaged in transmitting long radiotelegrams must suspend transmission at the end of each period of 15 minutes, and must remain silent during a period of 3 minutes before continuing transmission.

Coast and ship stations which work in the conditions laid down in Regulation XXXV, paragraph 2, must suspend work at the end of each period of 15 minutes, and keep watch on the wavelength of 600 metres during a period of 3 minutes before continuing transmission.

XXXIII.

Doubtful Messages.

1. When the signals become doubtful, all possible resources must be drawn upon to accomplish transmission. To this end, the radiotelegram shall be transmitted three times at most, at the request of the receiving station. If in spite of this triple transmission the signals are still unintelligible, the radiotelegram shall be cancelled.

If the acknowledgment of receipt does not come to hand, the sending station shall again call the station with which it is in correspondence. When no reply is made after three calls, the transmission shall not be persevered with. In such case, the sending station shall have the right to obtain the acknowledgment of receipt through the medium of another radiotelegraph station, using, when necessary, the lines of the telegraph system.

2. If the receiving station considers that, in spite of defective receiving, the radiotelegram can be delivered, it shall insert at the end of the preamble the service advice "Reception douteuse," and shall forward the radiotelegram. In such case, the Administration to which the coast station is subject shall claim the charges, in conformity with Clause XLII of the present Regulations. Nevertheless, if the ship station later on transmits the radiotelegram to another coast station of the same Administration, the latter can only claim the charges appertaining to a single transmission.

(D) ACKNOWLEDGMENT OF RECEIPT AND END OF WORK.

XXXIV.

Acknowledgment of Reception and Completion.

1. The acknowledgment of receipt shall be given in the form prescribed by the International Telegraph Regulations; it shall be preceded by the call signal of the sending station and followed by the call signal of the receiving station.

2. The end of the work between two stations shall be indicated by each one of them by means of the signal • • — • • followed by its own call signal.

(E) ROUTE TO BE TAKEN BY RADIOTELEGRAMS.

XXXV.

Route of Transmission.

1. As a general principle, the ship station shall transmit its radiotelegrams to the nearest coast station.

However, if the ship station has the choice between several coast stations at equal or nearly equal distances, it shall give the preference to that which is established on the territory of the country of destination or of normal transit of its radiotelegrams.

2. Nevertheless, a sender on board a ship shall have the right to indicate the coast station by which he wishes his radiogram to be forwarded. The ship station shall then wait until this coast station is the nearest.

Exceptionally, transmission may be made to a more distant coast station, provided:—

(a) That the radiotelegram is intended for the country in which such coast station is situated and that it comes from a ship subject to that country;

(b) That for calls and transmission both stations use a wavelength of 1,800 metres;

(c) That transmission by this wavelength does not disturb any transmission made, by means of the same wavelength, by a nearer coast station;

(d) That the ship station is more than 50 nautical miles distant from any coast station shown in the nomenclature. The distance of 50 miles may be reduced to 25 miles, subject to the reservation that the maximum power at the terminals of the generator do not exceed 5 kilowatts and that the ship stations be established in conformity with Regulations VII and VIII. The reduction of distance shall not apply in the seas, bays, or gulfs of which the shores belong to one country only, and of which the opening to the high sea is less than 100 miles wide.

VII.—DELIVERY OF RADIO-TELEGRAMS.

XXXVI.

Delivery.

When for any cause whatsoever a radiotelegram coming from a ship at sea and intended for *terra firma* cannot be delivered to the addressee, an advice of non-delivery shall be sent out. This advice shall be transmitted to the coast station which received the original radiotelegram. The latter, after verifying the address, shall forward the advice to the ship, if possible, and, if need be, by way of another coast station of the same country or of a neighbouring country.

When a radiotelegram, having arrived at the ship station, cannot be delivered, that station shall inform the office or ship station of origin by means of a service advice. In the case of radiotelegrams coming from *terra firma* this advice shall be transmitted, whenever possible, to the coast station by way of which the radiotelegram passed, or, if necessary, to another coast station of the same country or of a neighbouring country.

XXXVII.

Non-delivery.

If the ship to which the radiotelegram is addressed has not notified its presence to the coast station within the time specified by the sender, or, in the absence of such specification up to the morning of the eighth day following, such coast station shall give notice of the fact to the office of origin, which shall inform the sender of the same.

This latter shall have the option of requiring by paid service advice, telegraphic or postal, addressed to the coast station, that his radiotelegram be kept for a fresh period of nine days

for transmission to the ship, and so on. In the absence of such request the radiotelegram shall be returned as undelivered at the end of the ninth day (the day of handing in not to be included).

However, if the coast station is sure that the ship has left its radius of action before the station could have transmitted the radiotelegram to it, such station shall immediately inform the office of origin, which shall without delay advise the sender of the cancellation of the message. Nevertheless, the sender may, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

VIII.—SPECIAL RADIOTELEGRAMS.

XXXVIII.

Special Messages.

The following only shall be allowed :—

1st, *Reply Paid Radiotelegrams.*—These radiotelegrams shall bear, before the address, the indication, "Réponse payée," or "RP," completed by the mention of the amount paid in advance for the reply—for example : "Réponse payée fr. x," or "Rp. fr. x."

The reply voucher issued on board a ship shall give the right to send, up to the limit of its value, a radiotelegram to any address whatever from the ship station which issues such voucher.

2nd, *Collated Radiotelegrams.*

3rd, *Express Delivery Radiotelegrams.*—But only in cases in which the amount of the cost of express delivery is collected from the addressee. The countries which cannot adopt these radiotelegrams must notify the fact to the International Bureau. Radiotelegrams for express delivery, with collection of the cost from the sender, may be allowed when they are intended for the country in whose territory the corresponding coast station is situated.

4th, *Radiotelegrams for Delivery by Post.*

5th, *Multiple Radiotelegrams.*

6th, *Radiotelegrams with Acknowledgment of Receipt.*—But only with regard to notification of the date and time at which the coast station has transmitted to the ship station the telegram addressed to the latter.

7th, *Paid Service Advices.*—Except those asking for repetition of information. Nevertheless, all paid service advices shall be allowed on the route over the telegraph lines.

8th, *Urgent Radiotelegrams.*—But only in transmission over the telegraph lines, and subject to the application of the International Telegraph Regulations.

XXXIX.

Postal Radiotelegrams.

Radiotelegrams may be transmitted by a coast station to a ship, or by a ship to another ship, with the object of being forwarded by post, the posting to take place from a port of call of the receiving ship.

The address of these radiotelegrams must be drawn up as follows :—

1st, Paid instruction "poste," followed by the name of the port where the radiotelegram is to be posted ;

2nd, Full name and address of the addressee ;

3rd, Name of the ship station which is to carry out the posting ;

4th, When necessary, name of the coast station.

Example :—Poste Buenos Aires, Martinez
14 Calle Prat, Valparaiso, Avon Lizard.

The charge shall include, as well as the radiotelegraph and telegraph charges, a sum of 25 centimes for the postage of the radiotelegram.

IX.—ARCHIVES.

XI.

Records.

The originals of radiotelegrams, as well as the documents relating thereto, retained by the Administrations, shall be kept with all necessary precaution in respect of secrecy for at least fifteen months, counting from the month following that in which the radiotelegrams were handed in.

These originals and documents shall be sent, as far as possible, at least once a month by the ship stations to the Administrations to which they are subject.

X.—REFUNDS AND REIMBURSEMENTS.

XLI.

Refund of Charges.

With regard to refunds and reimbursements, the provisions of the International Telegraph Regulations shall apply, bearing in mind the restrictions laid down in Clauses XXXVIII and XXXIX of the present Regulations and subject to the following reservations :—

The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the Administration of the country of origin shall immediately initiate the reimbursement to the sender of the coast and ship charges in respect of such radiotelegram. In this case, the charges reimbursed shall not appear in the account for which provision is made by Regulation XLII, but the radiotelegram shall be mentioned therein as a memorandum.

Reimbursements shall be borne by the various Administrations and private enterprises which have taken part in the forwarding of the radiotelegram, each one of them relinquishing its share of the charge. Nevertheless, radiotelegrams falling under the provision of Articles VII and VIII of the Convention of St. Petersburg shall remain subject to the provisions of the International Telegraph Regulations, except when it is due to an error of service that such radiotelegrams have been accepted.

When the acknowledgment of receipt of a radiotelegram has not reached the station which transmitted the message, the charge shall not be refunded until it has been proved that the radiotelegram is one which gives occasion for reimbursement.

XI.—ACCOUNTING.

XLII.

Accounts.

1. Coast and ship charges shall not be entered in the accounts provided for by the International Telegraph Regulations.

The accounts relating to these charges shall be settled by the Administrations of the countries concerned. They shall be prepared by the Administrations to which the coast stations belong, and communicated by them to the Administrations concerned. In cases in which the working of the coast stations is independent of the Administration of the country, the person working these stations may be substituted in respect of accounts for the Administration of such country.

2. As to transmission over the lines of the telegraph system the radiotelegram shall be treated in respect of accounts in conformity with the Telegraph Regulations.

3. In the case of radiotelegrams originating from ships the Administration to which the coast station is subject shall debit the Administration to which the ship station of origin is subject with the coast and ordinary telegraph charges, the total charges collected for prepaid replies, the coast and telegraph charges collected for collations, the charges appertaining to express delivery (in the case provided for in Regulation XXXVIII) or delivery by post, and with those collected for supplementary copies (TM). The Administration to which the coast station is subject shall credit, when the case arises, through the channel of the telegraph accounts and through the medium of the offices which have taken part in the transmission of the radiotelegrams, the Administration to which the office of destination is subject with the total charges relating to prepaid replies. With regard to telegraph charges and charges relating to express delivery or delivery by post, and to supplementary copies, the procedure shall be in conformity with the telegraph regulations, the coast station being regarded as the telegraph office of origin.

In the case of radiotelegrams intended for a country lying beyond that to which the coast station belongs, the telegraph charges to be liquidated conformably to the above provisions are those which arise either from tables "A" and "B" appended to the International Telegraph Regulations or from special arrangements concluded between the Administrations of adjoining countries and published by those Administrations and not the charges which might be made under the special provisions of Regulations XXIII (paragraph 1) and XXVII (paragraph 1) of the Telegraph Regulations.

In the case of radiotelegrams and paid-service advices addressed to ships, the Administration to which the office of origin is subject shall be debited directly by that to which the coast station is subject with the coast and ship charges. Nevertheless, the total charges appertaining to prepaid replies shall be credited, if there is occasion, from country to country through the channel of Administration to which the coast station is subject. In respect to the telegraph charges for supplementary copies, the procedure shall be in conformity with the telegraph regulations. The Administration to which the coast station is subject shall credit that to which the ship of destination is subject with the ship charge, if there is occasion, with the charges belonging to the intermediate ship stations, with the total charge collected for prepaid replies, with the ship charge relating to collation, and also with the charges made for preparing supplementary copies and for delivery by post.

The paid service advices, and the prepaid replies themselves, shall be treated, in the radiotelegraphic accounts, in all respects like other radiotelegrams.

In the case of radiotelegrams forwarded by means of one or two intermediate ship stations, each of the latter shall debit that ship station of origin, if the radiotelegram is one coming from a ship, or the ship station of destination if the radiotelegram is one intended for a ship, with the ship charge due to it for transit.

4. In principle the settlement of account appertaining to exchanges between ship stations shall be made directly as between the companies working those stations, the station of origin being debited by the station of destination.

5. The monthly accounts serving as a basis for the special accounting in respect of radiotelegrams shall be drawn up radiotelegram by radiotelegram, with all necessary particulars, and within a period of six months counting from the month to which they belong.

6. The Governments reserve to themselves the option of making between themselves and with private companies (contractors working radiotelegraphic stations, shipping companies, etc.) special arrangements with a view to the adoption of other provisions respecting accounts.

XII.—INTERNATIONAL BUREAU.

XLIII.

Expenses.

The supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 fcs. per annum, not including special expenses to which the meeting of an International Conference gives rise. The Administrations of the contracting States shall be, for the purposes of contribution towards the expenses, divided into six classes as follows:—

1st Class.—Union of South Africa, Germany, United States of America, Alaska, Hawaii, and the other American possessions in Polynesia, the Philippine Islands, Porto Rico and the American possessions in the Antilles, the zone of the Panama Canal, the Argentine Republic, Australia, Austria, Brazil, Canada, France, Great Britain, Hungary, British India, Italy, Japan, New Zealand, Russia, Turkey.

2nd Class.—Spain.

3rd Class.—Russian Central Asia (littoral of the Caspian Sea), Belgium, Chili, Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Dutch Indies, Norway, Holland, Portugal, Roumania, Western Siberia (littoral of the Arctic Ocean), Eastern Siberia (littoral of the Pacific Ocean), Sweden.

4th Class.—Ex-German East Africa, Ex-German South-West Africa, The Cameroons, Togoland, Ex-German Pacific Protectorates, Denmark, Egypt, Indo-China, Mexico, Siam, Uruguay.

5th Class.—French West Africa, Bosnia-Herzegovina, Bulgaria, Greece, Madagascar, Tunis.

6th Class.—French Equatorial Africa, Portuguese West Africa, Portuguese East Africa and the Portuguese possessions in Asia, Bokhara, the Belgian Congo, the Colony of

Curaçao, the Spanish Colony of the Gulf of Guinea, Erythrea, Khiva, Morocco, Monaco, Persia, San Marino, Italian Somaliland.

XLIV.

Work of Berne Bureau.

The various Administrations shall forward to the International Bureau a form modelled on that hereto appended (see page 37) and containing the particulars enumerated in the form with regard to the stations covered by Clause V of the Regulations. Any modifications which may take place and additions shall be communicated by the Administrations to the International Bureau from the 1st to the 10th of each month. With the help of these communications the International Bureau will draw up the nomenclature provided for by Regulation V. The nomenclature shall be distributed to the Administrations concerned. It may also, with the supplements relating thereto, be sold to the public at cost price.

The International Bureau shall take care that the adoption of identical call signals for radiotelegraph stations be avoided.

XIII.—METEOROLOGICAL TRANSMISSIONS, TIME SIGNALS, AND OTHER TRANSMISSIONS.

XLV.

Meteorological and other Messages.

1. The Administrations shall take the necessary steps to supply their coast stations with meteorological telegrams containing the particulars of interest to the district of such stations. These telegrams, the text of which must not exceed twenty words, shall be sent to the ships which ask for them. The charge for these meteorological telegrams shall be carried to the account of the ships to which they are addressed.

2. The meteorological observations, made by certain ships appointed for that purpose by the country to which they belong, may be sent once a day as paid service advices to the coast stations authorised to receive them by the Administrations concerned, who shall also appoint the meteorological offices to which these observations shall be addressed by the coast station.

3. Time signals and meteorological telegrams shall be transmitted in succession one to another in such a way that the total duration of their transmission does not exceed ten minutes. In principle, while they are being sent, radiotelegraph stations, transmission by which might disturb the reception of these signals and telegrams, shall keep silent so as to allow all stations which desire to do so to receive these telegrams and signals. Exception shall be made in the case of distress calls and State telegrams.

4. The Administrations shall facilitate the communication to the marine information agencies which they may appoint of the information respecting wrecks and casualties at sea, or presenting a general interest for navigation, which the coast stations can communicate regularly.

XIV.—MISCELLANEOUS PROVISIONS.

XLVI.

Interference.

Transmission exchanged between ship stations must be carried out in such a way as not to interfere with the service of coast stations, as the latter must have, as a general rule, right of priority for public correspondence.

XLVII.

Compulsory Retransmission.

Coast stations and ship stations shall be bound to take part in the retransmission of radiotelegrams in cases in which communication cannot be established directly between the stations of origin and destination.

Nevertheless, the number of transmissions shall be limited to two.

In the case of radiotelegrams intended for *terra firma* use may only be made of retransmissions to reach the nearest coast station.

Retransmission shall be in all cases subject to the condition that the intermediate station which receives the radiotelegram in transit is in a position to send it on.

XLVIII.

Non-Contracting Governments.

If the transmission of a radiotelegram is carried out partly on the telegraph lines or through radiotelegraph stations belonging to a non-contracting Government, such radiotelegram may be sent forward, subject to the reservation that at least the Administrations to which these lines or stations belong shall have declared that they are willing to apply, when the case arises, the provisions of the Convention and of the Regulations, which are indispensable, in order that radiotelegrams may be regularly forwarded, and that accounting may be assured.

Such declaration shall be made to the International Bureau, and brought to the knowledge of the offices of the Telegraph Union.

XLIX.

Operation of Modifications to Regulations.

The modifications of the present Regulations which may be rendered necessary in consequence of the decisions of future Telegraph Conferences shall come into force on the date fixed for the application of the provisions decided upon by each one of these later Conferences.

L.

Application of International Telegraph Regulations.

The provisions of the International Telegraph Regulations shall apply by analogy to radiotelegraph correspondence in so far as they are not contrary to the provisions of the present Regulations.

The following in particular apply to radiotelegraph correspondence:—

The provisions of Article XXVII, paragraphs 3 to 6, of the Telegraph Regulations referring to the collection of charges; those of Articles XXXVI and XLI referring to the indication of the route to be taken; those of Articles LXXV, paragraph 1, LXXVIII, paragraphs 2 to 4, and LXXIX, paragraphs 2

to 4, relating to preparing of accounts. Nevertheless, first, the period of six months provided by paragraph 2 of Article LXXIX of the Telegraph Regulations for the verification of accounts is extended to nine months in the case of radiotelegrams; second, the provisions of Article XVI, paragraph 2, are not considered as authorising the free transmission by radiotelegraph stations of service telegrams relating exclusively to the telegraph service, nor the free transmission over the lines of the telegraph system of service telegrams relating exclusively to the radiotelegraph service; third, the provisions of Article LXXIX, paragraphs 3 and 5, do not apply to radiotelegraph accounting. For the purposes of apply-

ing the provisions of the Telegraph Regulations coast stations shall be regarded as offices of transit, except when the Radiotelegraphic Regulations stipulate expressly that these stations are to be considered as offices of origin or destination.

Conformable to Article II of the Convention of London the present regulations will come into force on July 1st, 1913.

In witness whereof the respective Plenipotentiaries have signed these Regulations on a single copy, which will remain deposited in the Archives of the British Government, and of which a copy will be sent to each party.

APPENDIX

I.

TABLE REFERRED TO IN REGULATION XLIV (p 36).

(a) COAST STATIONS.

Name.	Nationality.	Geographical Position. E=East longitude; O=West longitude; N=North latitude; S=South latitude. Territorial subdivisions.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres (the normal wavelength is underlined).
Nature of Services effected.		Working hours (Time according to the Meridian).	Coast Charge.			Observations. (if occasion, Time and Method of sending Time-Signals and Meteorological Telegrams).
			Per Word in Francs.	Minimum per Radiotelegram in Francs.		

(b) SHIP STATIONS.

Name.	Nationality.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres.
Nature of Services effected.	Working Hours.	Ship Charge.			Observations. (if occasion, Name and Address of the person working the Station).
		Per Word in Francs.	Minimum per Radiotelegram in Francs.		

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS
(referred to in Article XXII, p. 31).

(The abbreviations are to be found in the Code Section).

INTERNATIONAL CONVENTION

ON

SAFETY OF LIFE AT SEA

London, January 20th, 1914.

THE London International Conference on the Safety of Life at Sea, by which the Convention signed on January 20th, 1914, has been drawn up, met for the first time on November 12th, 1913, at the Foreign Office, London. The suggestion that such a Conference should be held emanated from the ex-German Emperor, and the task of convening it was undertaken by the British Government. The following States were represented: Great Britain, Germany, the United States, Australia, Austria-Hungary, Belgium, Canada, Denmark, Spain, France, Italy, Japan, Norway, the Netherlands, Russia, Sweden, and New Zealand. The delegations from the different States, were composed, not of the representatives of the shipping trade, but of administrators, experts and jurists.

The late Lord Mersey was appointed Chairman of the Conference. To deal with the specific subjects submitted to it the Conference appointed five sub-committees, together with a sixth sub-committee for drafting the Convention, which was to embody the recommendations of the Committees as approved by the whole Conference.

The Convention contains seventy-four articles, of which we present below those articles which govern the use of wireless telegraphy:—

CHAPTER I.

SAFETY OF LIFE AT SEA.

Article 1.—The High Contracting Parties undertake to give effect to the provisions of this Convention, for the purposes of securing safety of life at sea, to promulgate all regulations and to take all steps which may be necessary to give the Convention full and complete effect.

The provisions of this Convention are completed by Regulations which have the same force and take effect at the same time as the Convention. Every reference to the Convention implies at the same time a reference to the Regulations annexed thereto.

CHAPTER II.

SHIPS TO WHICH THIS CONVENTION APPLIES.

Article 2.—Except where otherwise provided by this Convention, the merchant ships of any of the States of the High Contracting Parties, which are mechanically propelled, which carry more than 12 passengers, and which proceed from a port of one of the said States to a port situated outside that State, or conversely, are subject to the provisions of this Convention. Ports situated in the Colonies, Possessions, or Protectorates of the High Contracting Parties are considered to be ports outside the States of the High Contracting Parties.

Persons who are on board by reason of *force majeure* or in consequence of the obligation laid upon the master to carry ship-

wrecked or other persons, are not deemed to be passengers.

Article 3.—There are excepted from this Convention, save in the cases where the Convention otherwise provides, ships making voyages specified in a schedule to be communicated by each High Contracting Party to the British Government at the time of ratifying the Convention.

No schedule may include voyages in the course of which the ships go more than 200 sea miles from the nearest coast.

Each High Contracting Party has the right subsequently to modify its schedule of voyages in conformity with this Article on condition that it notifies the British Government of such modification.

Each High Contracting Party has the right to claim from another Contracting Party the benefit of the privileges of the Convention for all of its ships which are engaged in any one of the voyages mentioned in its own schedule. For this purpose the Party claiming such benefit shall impose on the said ships the obligations prescribed by the Convention in so far as, having regard to the nature of the voyage, these obligations would not be unnecessary or unreasonable.

Article 4.—No ship, not subject to the provisions of the Convention at the time of its departure, can be subjected to the Convention in the course of its voyage if stress of weather or any other cause of *force majeure* compels it to take refuge in a port of one of the States of the High Contracting Parties.

CHAPTER III.

SAFETY OF NAVIGATION.

Article 5.—When the expression "every ship" is used in this chapter and in the corresponding part of the annexed Regulations it includes all merchant ships, whether they are the ships defined in Article 2 or not, which belong to any of the Contracting States.

Article 6.—The High Contracting Parties undertake to take all steps to ensure the destruction of derelicts in the northern part of the Atlantic Ocean east of a line drawn from Cape Sable to a point situated in latitude 34° north and longitude 70° west. Further, they will establish in the North Atlantic with the least possible delay a service for the study and observation of ice conditions and a service of ice patrol. For this purpose:

Two vessels shall be charged with these three services.

During the whole of the ice season they shall be employed in ice patrol.

During the rest of the year the two vessels shall be employed in the study and observation of ice conditions and in the destruction of derelicts; nevertheless the study and observation of ice conditions shall be effectively maintained, in particular from the beginning of February to the opening of the ice season.

While the two vessels are employed in ice patrol the High Contracting Parties, to the extent of their ability and so far as the exigencies of the Naval Service will permit, will send warships or other vessels to destroy any dangerous derelicts, if this destruction is considered necessary at that time.

Article 7.—The Government of the United States is invited to undertake the management of the three services of derelict destruction, study and observation of ice conditions, and ice patrol. The High Contracting Parties which are specially interested in these services, and whose names are given below, undertake to contribute to the expense of establishing and working the said services in the following proportions:—

	Per cent.
Austria-Hungary	2
Belgium	4
Canada	2
Denmark	2
France	15
Germany	15
Great Britain	30
Italy	4
Netherlands	4
Norway	3
Russia	2
Sweden	2
United States of America ..	15

Each of the High Contracting Parties has the right to discontinue its contribution to the expense of working these services after September 1st, 1916. Nevertheless, the High Contracting Party which avails itself of this right will continue responsible for the expenses of working up to the 1st September following the date of denunciation of the Convention on this particular point. To take advantage of the said right, it must give notice to the other Contracting Parties at least six months before the said 1st September; so that, to be free from its obligations on September 1st, 1916, it must give notice on March 1st, 1916, at the latest, and similarly for each subsequent year.

In case the United States Government should not accept the proposal made to them,

or in case one of the High Contracting Parties for any reason, should not assume responsibility for the pecuniary contribution defined above, the High Contracting Parties shall settle the question in accordance with their mutual interests.

The Government of the High Contracting Party which undertakes the management of the service of derelict destruction is invited to devise means of granting, at the expense of this service, to merchant ships, which have contributed in an effective manner to the destruction of ocean derelicts, rewards to be fixed by the Government in accordance with the services rendered.

The High Contracting Parties which contribute to the cost of the three above-mentioned services shall have the right by common consent to make from time to time such alterations in the provisions of this Article and of Article 6 as appear desirable.

Article 8.—The master of every ship which meets with dangerous ice or a dangerous derelict is bound to communicate the information by all the means of communication at his disposal to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate.

Every Administration which receives intelligence of dangerous ice or a dangerous derelict shall take all steps which it thinks necessary for bringing the information to the knowledge of those concerned and for communicating it to the other Administrations.

The transmission of the messages respecting ice and derelicts is free of cost to the ships concerned.

It is desirable that the said information should be sent in a uniform manner. For this purpose a code, the use of which is optional, appears in Article I on the Regulations annexed hereto.

Article 9.—The master of every ship fitted with a radiotelegraph installation, on becoming aware of the existence of an imminent and serious danger to navigation, shall report it immediately in the manner prescribed by Article II of the Regulations annexed hereto.

Article 10.—When ice is reported on, or near his course, the master of every ship is bound to proceed at night at a moderate speed, or to alter his course so as to go well clear of the danger zone.

Article 11.—The ships defined by Article 2 shall have on board a Morse signalling lamp of sufficient range.

The use of Morse signals is regulated by the Code appearing in Article III, as well as by Article IV of the Regulations annexed hereto.

Article 12.—The use of the international distress signals for any other purpose than that of signals of distress is prohibited on every ship.

The use of private signals which are liable to be confused with the international distress signals is prohibited on every ship.

Article 13.—The selection of the routes across the North Atlantic in both directions is left to the responsibility of the steamship companies. Nevertheless the High Contracting Parties undertake to impose on these companies the obligation to give public notice of the regular routes which they propose their vessels should follow, and of any changes which they make in them.

The High Contracting Parties undertake further, to use their influence to induce the

owners of all vessels crossing the Atlantic to follow as far as possible the routes adopted by the principal companies.

Article 14.—The High Contracting Parties undertake to use all diligence to obtain from the Governments which are not parties to this Convention their agreement to the revision of the International Regulations for Preventing Collisions at Sea as indicated below:—

(A) The Regulations shall be completed or revised in regard to the following points:

- (1) The second white light.
- (2) The stern light.
- (3) A day signal for motor vessels.
- (4) A sound signal for a vessel towed.
- (5) The prohibition of signals similar to distress signals.

(B) Articles 2, 10, 14, 15, 31 of the said Regulations shall be amended in accordance with the following provisions:

Article 2. The second white mast-head light to be compulsory.

Article 10. A permanent fixed stern light to be compulsory.

Article 14. A special day signal to be compulsory for motor vessels.

Article 15. A special sound signal to be established for use by a vessel in tow, or if the tow is composed of several vessels, by the last vessel of the tow.

Article 31. Article 31 to be modified in the following manner: Add to the lists of both day and night signals the international radiotelegraph distress signal.

Article 15.—The Governments of the High Contracting Parties undertake to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that from the point of view of safety of life at sea, the ships defined in Article 2 shall be sufficiently and efficiently manned.

Chapter IV, which contains Articles 16 to 30, refers to construction.

CHAPTER V.

RADIOTELEGRAPHY.

Article 31.—All merchant ships belonging to any of the Contracting States, whether they are propelled by machinery or by sails, and whether they carry passengers or not, shall, when engaged on the voyages specified in Article 2, be fitted with a radiotelegraph installation if they have on board fifty or more persons in all.

Advantage may not be taken of the provisions of Articles 2 and 3 of this Convention to exempt a ship from the requirements of this chapter.

Article 32.—Ships on which the number of persons on board is exceptionally and temporarily increased up to or beyond fifty as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons, are exempted from the above obligation.

Moreover, the Governments of each of the Contracting States, if they consider that the route and the conditions of the voyage are such as to render a radiotelegraph installation unreasonable or unnecessary, may exempt from the above requirement the following ships:—

(1) Ships which in the course of their voyage do not go more than 150 sea miles from the nearest coast.

(2) Ships on which the number of persons

on board is exceptionally or temporarily increased up to or beyond fifty by the carriage of cargo hands or a part of the voyage, provided that the said ships are not going from one Continent to another, and, that, during that part of their voyage, they remain within the limits of latitude 30° N. and 30° S.

(3) Sailing vessels of primitive build, such as *dhow*s, *junks*, etc., if it is practically impossible to install a radiotelegraph apparatus.

Article 33.—Ships which, in accordance with Article 31 above, are required to be fitted with a radiotelegraph installation are divided, for the purpose of radiotelegraph service, into three classes, in accordance with the classification established for ship stations in Article XIII (b) of the Regulations annexed to the Radiotelegraph Convention, signed in London on July 5th, 1912, viz:—

First Class.—Ships having a continuous service.

There shall be placed in the First Class ships which are intended to carry twenty-five or more passengers:—

(1) If they have an average speed in service of fifteen knots or more;

(2) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board two hundred persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports. Nevertheless these ships may be placed in the Second Class on condition that they have a continuous watch.

Second Class.—Ships having a service of limited duration.

There shall be placed in the Second Class all ships which are intended to carry twenty-five or more passengers, if they are not, for other reasons, placed in the First Class.

Ships placed in the Second Class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

Third Class.—Ships which have no fixed periods of service.

All ships which are placed neither in the First nor in the Second Class shall be placed in the Third Class.

The owner of a ship placed in the Second or in the Third Class has the right to require that, if the ship complies with all the requirements for a superior class, a statement to the effect that it belongs to that superior class shall be inserted in the Safety Certificate.

Article 34.—Ships which are required by Article 31 above to be fitted with a radiotelegraph installation shall be required, by the Government of the countries to which they belong, to maintain a continuous watch during navigation as soon as the said Governments consider that it will be of service for the purpose of safety of life at sea.

Meanwhile, the High Contracting Parties undertake to require, from the date of the ratification of the present Convention, subject to the delays specified below, a continuous watch on the following ships:—

(1) Ships whose average speed in service exceeds thirteen knots, which have on board 200 persons or more, and which, in the course of their voyage, go a distance of more than 500 sea miles between two

consecutive ports, when these ships are placed in the Second Class.

(2) Ships in the Second Class, for the whole of the time during which they are more than 500 sea miles from the nearest coast.

(3) Other ships specified in Article 31, when they are engaged in the Trans-Atlantic trade, or when they are engaged in other trades if their route takes them more than 1,000 sea miles from the nearest coast.

Ships connected with all kinds of fishing business, including whaling, which are required to be fitted with a radiotelegraph installation, shall not be required to maintain a continuous watch.

The continuous watch may be kept by one or more operators, holding certificates in accordance with Article X of the Regulations annexed to the International Radiotelegraph Convention, 1912, together, if necessary, with one or more certificated watchers. Nevertheless, if an efficient automatic calling apparatus is invented, the continuous watch may be maintained by this means by agreement between the Governments of the High Contracting Parties.

By "certificated watcher" is meant any person holding a certificate issued under the authority of the Administration concerned. To obtain this certificate, the applicant must prove that he is capable of receiving and understanding the radiotelegraph distress signal and the safety signal described in the Regulations annexed hereto.

The High Contracting Parties undertake to take steps to ensure that the certificated watchers observe the secrecy of correspondence.

Article 35.—The radiotelegraph installations required by Article 31 above shall be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 sea miles by day under normal conditions and circumstances.

Every ship which is required, in conformity with the provisions of Article 31 above, to be fitted with a radiotelegraph installation, shall, whatever be the class in which it is placed, be provided in accordance with Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, with an emergency installation, every part of which is placed in a position of the greatest possible safety to be determined by the Government of the country to which the ship belongs.

In all cases the emergency installation must be placed, in its entirety, in the upper part of the ship, as high as practically possible.

The emergency installation includes, as provided by Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, an independent source of energy capable of being put into operation rapidly and of working for at least six hours with a minimum range of eighty sea miles for ships in the First Class and fifty sea miles for ships in the two other classes.

If the normal installation, which, in accordance with this Article, has a range of at least 100 sea miles, satisfies all the conditions prescribed above, an emergency installation is not required.

The licence provided for in Article IX of the Regulations annexed to the International Radiotelegraph Convention, 1912, may not be issued unless the installation complies both with the provisions of that Con-

vention and also with the provisions of this Convention.

Article 36.—The matter governed by the International Radiotelegraph Convention, 1912, and the Regulations annexed thereto, and in particular the radiotelegraph installations on ships, the transmission of messages, and the certificates of the operators, remain and will continue subject to the provisions:

(1) Of that Convention and the Regulations annexed thereto, or of any other instruments which may in the future be substituted therefor;

(2) Of this Convention, in regard to all the points in which it supplements the aforementioned documents.

Article 37.—Every master of a ship who receives a call for assistance from a vessel in distress is bound to proceed to the assistance of the persons in distress.

Every master of a vessel in distress has the right to requisition from among the ships which answer his call for assistance the ship or ships which he considers best able to render him assistance, but he must exercise this right only after consultation, so far as may be possible, with the masters of those ships. Such ships are then bound to comply immediately with the requisition by proceeding with all speed to the assistance of the persons in distress.

The masters of the ships which are required to render assistance are released from this obligation as soon as the master or masters requisitioned have made known that they will comply with the requisition, or as soon as the master of one of the ships which has reached the scene of the casualty has made known to them that their assistance is no longer necessary.

If the master of a ship is unable, or considers it unreasonable or unnecessary, in the special circumstances of the case, to go to the assistance of the vessel in distress, he must immediately inform the master of the vessel in distress accordingly. Moreover, he must enter in his log book the reasons justifying his action.

The above provisions do not prejudice the International Convention for the unification of certain rules with respect to Assistance and Salvage at Sea, signed at Brussels on September 23rd, 1910, and in particular the obligation to render assistance laid down in Article II of that Convention.

Article 38.—The High Contracting Parties undertake to take all steps necessary for giving effect to the provisions of this chapter with the least possible delay. Nevertheless, they may allow:

A delay not exceeding one year, from the date of the ratification of this Convention, for the provision and training of operators and for the installation of the apparatus on ships placed in the First and Second Classes.

A delay not exceeding two years, from the date of the ratification of this Convention, for the provision and training of the operators and watchers on the ships in the Third Class, for the installation of the apparatus on ships in the Third Class and for the establishment of a continuous watch on ships placed in the Second and Third Classes.

Chapter VI refers to Life-saving Appliances and Fire Protection,

REGULATIONS.
SAFETY OF NAVIGATION.

ARTICLE I.

CODE FOR THE TRANSMISSION BY RADIOTELEGRAPHY OF
INFORMATION RELATING TO ICE, DERELICTS, AND WEATHER.

Information relating to ice, derelicts and weather codes is to be found in the Scientific Signal Section of this book.

ARTICLE II.

SAFETY SIGNAL.

Information relating to the Safety Signal is to be found in the Scientific Signal Section of this book.

ARTICLE III.

MORSE CODE.

See Code Section of this book for information relating to the Morse Code and Signals.

SAFETY CERTIFICATE.

Radiotelegraph installation :—

		Class and numbers required by Articles 33 and 34 of the said Convention.	Actual class and numbers.
Class of Ship :—		—	—
Number of {	Operators of the 1st Class ..	—	—
	" 2nd " ..	—	—
	Certificated Watchers	—	—

III. That in all other respects the ship complies with the requirements of the said Convention so far as those requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

Issued at

the

day of

LAWS AND REGULATIONS AFFECTING RADIOTELEGRAPHY AND TELEPHONY.

THE VARIOUS ACTS, DECREES, REGULATIONS, ETC., REFERRED TO IN THE FOLLOWING LAWS ARE ENUMERATED AT THE BEGINNING OF EACH COUNTRY'S LAWS AND DISTINGUISHED BY CAPITAL LETTERS OF THE ALPHABET.

AFGHANISTAN

(See Maps 16, 18 and 21).

AFGHANISTAN is ruled by the Amir, assisted by governors of the four provinces of Kabul, Turkestan, Herat and Kandahar. A treaty between Great Britain and Afghanistan, to last for three years from November, 1921, recognises the complete independence of this State.

CONTROL AND ORGANISATION.

As far as can be ascertained up to the time of going to press, no special laws or regulations for the control of wireless telegraphy are in force.

A small 120 watt C.W. station was presented to Afghanistan by the Indian Government and has been installed at Kabul, working with Peshawar on the Indian Frontier.

ANGOLA

(See Maps 24 and 31)

THIS Colony, otherwise known as Portuguese West Africa, is under the jurisdiction of a High Commissioner, whose headquarters are at Loanda, the capital.

CONTROL.

Radiotelegraphy in the Colony constitutes a Government monopoly, but, in 1922, a Portuguese Company was authorised to build a station at Loanda, to communicate with Lisbon via Cape Verde Islands. All matters in relation thereto are in the care of a communications office.

There are no aviation or meteorological stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Commander Luiz Couceiro ..	Communications Secretary	Loanda

ORGANISATION.

The decree for the creation of a wireless service in the Province of Angola was gazetted in Lisbon on September 23rd, 1918. The scheme includes: One 15-kW. station at Loanda; twenty-two 3-kW. stations at Cabinda, Maquela, Encoge, Malange, Saurimo, Novo Redondo, Lobito, Huambo, Moxico, Caquengue, Mossamedes, Lubango, Mulongo, Cuanhama, Posto A, Cuangar, Cangamba, Caiundo, Dirico and Luati; nine 1½-kW. field stations (type F); two ½-kW. pack stations for the army.

For public and official service there are: Eight coast stations, situated respectively at Cabinda, Santo Antonio do Zaire, Ambriz, Loanda, Novo Redondo, Lobito, Mossamedes, Baia dos Tigres; six inland stations, respectively at Malanga, Saurimo, Dundo, Huambo, Camacupa and Lubango.

In Loanda there are 3-kW. and 15-kW. spark and 3-kW. C.W. stations, and in Lobito 3-kW. spark and 15 kW. C.W. stations. More inland stations are under construction at Maquela, Cangamba, Ochinjau and Ngiva.

ADMINISTRATION.

The laws, regulations, etc., governing the administration of wireless telegraphy in this territory are identical with those used in Portugal.

ARGENTINE REPUBLIC

(See Maps 49, 51 and 53.)

ARGENTINE (Republica Argentina) is situated in the southern portion of South America. A Republican Government was constituted in 1853, and the National Constitution elaborated, with modifications introduced in 1860, 1866, and 1898.

CONTROL.

The Radiotelegraphic Law, passed in October, 1914, definitely assigned the direction of wireless telegraphy and the public wireless service to the Ministries of Interior and Marine.

The Ministry of Marine has jurisdiction over zones extending as far as 100 kilometres from the sea coast and the Rio de la Plata and 50 kilometres on each bank of the navigable rivers. The rest of the country is under the jurisdiction of the Ministry of War.

The chief of the public maritime radiotelegraph service is the General Secretary of the Ministry of Marine, under the direct control of which is the "Division Servicio Radiotelegrafico," which has authority over everything concerning radiotelegraphy within the maritime zone. Under the control of the Ministry of Marine there are 21 coastal radiotelegraph stations. According to the latest information, they are:—

Commercial traffic with ships	.. .. .	16
Naval official traffic only	.. .. .	6
Public correspondence in the inland service	.. .. .	17
Official correspondence inland	.. .. .	2

There are also 77 ship stations.

Six new radiotelegraphic stations are being constructed.

The "Division Servicio Radiotelegrafico" has its own radiotelegraph works which construct and repair the greater part of the apparatus used in the Navy. These works are also able to effect repairs to radiotelegraph apparatus of merchant vessels calling at Argentine ports.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Dr. Julio Moreno	Minister of Marine	Buenos Aires
Sir Ricardo Ugarriza	Secretary-General of the Ministry and Chief of the Public Maritime Radiotelegraphic Service	Buenos Aires
Lt.-Col. Francisco Arnaut	Chief of the Divisional Radiotelegraphic Service	Buenos Aires

The Supreme Government has granted four licences to different companies to instal and work within the country high-power radiotelegraph stations intended for intercontinental radio communication. These companies are: the Compania Marconi de Telegrafia sin Hilos de la Plata (English), which will place this country in communication with England; the Pan American Wireless Telegraph and Telephone Company (North American), which communicates direct with the United States; Transradio Argentina, Radiotelegraphic Company, for service with Germany; and the

Compagnie Générale de Télégraphie sans Fils, for service with France. These licences last for a period of thirty years, at the end of which time the goods and installations possessed by the companies will be handed over to the power of the State without any indemnity.

There are also some private stations of very small energy, the installations of which are used solely for experimental purposes.

ORGANISATION.

The station of Dársena Norte transmits daily to all ships and coast stations a news service, as does likewise the radiotelegraph "top" which gives the official time.

There are no special publications devoted to wireless.

ADMINISTRATION.

Below are given the laws and regulations in force at the present time:—

A—Law No. 9,127 regarding radiotelegraphy.

B—Regulations made by the Executive Power for Radiotelegraphy.

C—Decrees of the Executive Power amplifying the regulations.

LAW.

A LAW NO. 9,127 PASSED BY THE NATIONAL CONGRESS ON SEPTEMBER 16TH, 1913.

ART. 1.—The wireless service within the national territory, and for international communications within a minimum distance of 1,000 kilometres, shall be exclusively under the control of the State.

ART. 2.—The executive shall attend to the erection of wireless stations within the national territory, and shall so select the sites for the coast ones that all ships sailing near our coasts and navigating our rivers may always be in touch with them.

ART. 3.—The sum of \$400,000 national currency are hereby allocated to the above. This amount will be charged to General Expenses.

ART. 4.—The use of wireless apparatus in perfect working order is hereby declared compulsory for all ships calling at the ports of Argentina carrying fifty or more persons on board, counting the passengers and the crew, on and after ninety days have elapsed since the promulgation of this law.

ART. 5.—Wireless apparatus handled by skilled operators must have at all times a transmission power of not less than 200 kilometres for river craft, and not less than 500 kilometres for sea-going vessels.

ART. 6.—No ships will be allowed to leave port until the prescriptions of Arts. 4 and 5 have been complied with, and should the captain or the officer in charge try to elude or contravene this regulation, the superior local marine authority shall impose a fine of from 1,000 to 5,000 pesos. The party so fined can appeal to the federal magistrate of the district where the contravention has been committed. A double fine will be the penalty for a repetition of the offence.

ART. 7.—The Executive will promulgate the regulations in accordance with this law.

ART. 8.—The above Act of Parliament shall be communicated to the Executive.

The above was approved by the Argentine Congress in the city of Buenos Aires on the sixteenth day of September in the year of our Lord nineteen hundred and thirteen.

EXECUTIVE DECREE OF JULY 12TH, 1917.

This is divided into two parts. Of these Part I. only is printed.

PART I. CHAPTER I.

SUB-SECTION I.

B ART. 1.—The "General Rules and Regulations for the Radiotelegraphic Service in the Argentine Republic," as issued by the Secretary-General of the Marine Ministry are hereby approved.

ART. 2.—The following Regulations and Ordinances are hereby repealed:

Regulations for the Radiotelegraphic Stations of the Navy (December 1st, 1906).
Regulations and Plan of Studies for the Radiotelegraphic Staff (November 27th, 1912).

Regulations for the Radiotelegraphic Service (July 5th, 1913).

Regulations for the Radiotelegraphic Service in the Argentine Republic (October 24th, 1914), and every other regulation affecting the Radiotelegraphic Service issued either as General Instructions, Orders of the Day or Circular Letters from the Marine Ministry, as from the year 1906 inclusive to this date.

ART. 3.—The necessary copies of the new Rules, as mentioned in Art. 1 to be printed.

ART. 4.—This decree to be communicated, published, etc.

(Signed) Irigoyen,

F. ALVAREZ DE TOLEDO.

The following are the documents approved by the Executive Decree above quoted:—

SUB-SECTION 2.

ORGANISATION OF THE RADIOTELEGRAPHIC DEPARTMENT.

ART. 1.—The Radiotelegraphic Service constitutes a Department of the General-Secretaryship of the Ministry of Marine.

ART. 2.—The following duties correspond to this Department:—

(a) To intervene in everything affecting the military and public radiotelegraphic service depending from the Ministry of Marine and under its inspection and control.

(b) To intervene in the formation of reports and in the claims and suits that may be promoted.

(c) To study and comply with the international laws, regulations, instructions and conventions or pacts that may affect this service.

(d) To work in the reforms tending to improve the service both in connection with technical details and those of a purely disciplinary character.

(e) To intervene in the preparation of instruction plans and the examination of subordinate radiotelegraphists and civil operators, to propose their promotion and to issue the corresponding credentials (*patentes*).

(f) To intervene in the purchase of radiotelegraphic materials, giving advice and reporting on results.

(g) To attend to that part of the correspondence and intercourse with the Berne International Office referring to this service.

ART. 3.—The Radiotelegraphic Service Department will be divided into the following sections:—

(a) Injuries, Correspondence, and Archives.

(b) Technical Inspection and Superintendency.

(c) Shop, Installations, and Repairs.

(d) Test of apparatus and materials.

(e) Accounting.

ART. 4.—The staffs in the land stations and in the floating lighthouses will be as permanent as consistent with the good service. The staffs will in matters affecting discipline, re-examination and licences, be subordinate to the Secretary of the Ministry; but the last-named officer will see that the General Direction of Personnel is kept informed of the changes occurring in this service.

With the General Secretary rests the duty of putting before the General Director of Personnel any changes that may be considered necessary in the radiotelegraphic staffs on board units of the Navy.

CHAPTER II.

REGULATIONS GOVERNING THE RADIOTELEGRAPHIC SERVICE.

SUB-SECTION I.

JURISDICTION OF THE SEVERAL MINISTRIES ACCORDING TO LAW NO. 9127.

ART. 1.—The national territory is hereby divided into two zones for the purposes of jurisdiction and regularisation affecting the service of radiotelegraphic installations. The aforesaid zones are as follows:—

(a) The *Maritime Zone*, which includes all ship stations in the maritime territorial waters and navigable rivers, besides all land stations situated within one hundred kilometres from the sea and River Plate coasts and those situated within fifty kilometres from the banks of any other navigable rivers.

(b) The *Terrestrial Zone*, which includes all other installations on national territory which are not covered by the above.

ART. 2.—(a) The Maritime Zone is under the jurisdiction of the Minister of Marine, who is responsible for the control of the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless service in this particular zone.

(b) The Minister of Marine shall also undertake the duty of transmitting all information of any nature which may be asked from him by the International Bureau of Berne.

ART. 3.—(a) The Terrestrial Zone is under the jurisdiction of the Minister of the Interior, who controls the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless in this particular zone.

(b) In special cases when a state of siege is declared, all installations in this zone shall be placed under the control of the War Office.

ART. 4.—Other Executive Offices can order the installation of wireless stations for their exclusive use, but in such cases the working of such installations must be authorised by the Minister exercising control in the respective zones, and the rules and regulations prescribed for the latter must be observed in these particular stations.

ART. 5.—All wireless installations erected in the national territory must observe the international rules and regulations adhered to by the Government of the Republic, and the General Law regulating the Telegraphic Service must be observed in all matters appertaining to the Public Radiotelegraphic Service.

SUB-SECTION 2.

PERMITS FOR THE INSTALLATION OF PRIVATELY OWNED RADIOTELEGRAPHIC STATIONS.

ART. 1.—Law 9127 having been passed with the object of nationalising of the wireless service, the installation of high-powered wireless stations by private individuals or corporations shall only be allowed in the national territory when such installations are destined for inter-continental communication.

ART. 2.—The granting of such concessions as authorised by Art. 1 corresponds to the Minister in whose jurisdiction the new station is to be erected.

ART. 3.—Where the Minister having control over the zone where the wireless installation is to be erected has given his consent; all the rulings of said Ministry, or any other of its decisions regarding the stations directly dependent on the said installation, must be obeyed unquestionably.

ART. 4.—In general it shall be the duty of the Minister of the Interior to negotiate the bases of agreements in course of conclusion with neighbouring countries, and he will communicate with the Minister of Marine the results arrived at in the course of such negotiations, so that the latter may give effect to any such conventions in so far as they affect his department. The Minister of Marine shall have the right of being consulted in the negotiation of the bases for such conventions.

ART. 5.—No radiotelegraphic (transmitting or receiving) station will be erected without obtaining first the necessary licence from the Minister in whose jurisdictional zone the station is to be established.

ART. 6.—To obtain the licence referred to in Art. 5, the installation must fulfil the following requirements:—

(1) The primary transmitting power must not exceed 50 watts.

(2) The wavelength must not exceed 300 metres in the transmitter.

(3) The receiver may be suitable to receive waves of any length, providing that the Executive Government have no objection thereto.

(4) The installation must not be used for any interchange of messages in the public service. It will be devoted to experimenting and only when in the judgment of the Government no harm or disturbance would

arise from its use to the nearest national stations can the installation send or receive special messages.

ART. 7.—Anyone infringing the rules set out in Arts. 5 and 6 will be penalised in accordance with the penalties established in the General Law relating to the National Telegraph Service.

ART. 8.—Private installations authorised in accordance with Art. 6 must be inspected by the official inspectors, who are entitled to all the information and data they may demand. These installations must be registered and the wireless apparatus must be stamped by an inspector. The Minister exercising jurisdiction in the respective zone can order at any time the closing of authorised private wireless installations.

SUB-SECTION 3.

REGULATIONS AFFECTING ALL INSTALLATIONS ON NATIONAL TERRITORY AND ON BOARD SHIPS.

ART. 1.—The power to be used in all installations on land will be limited to that necessary for communication with the nearest stations in the system. Coast installations which must have high power in order to communicate at long distances are excluded from this limitation.

ART. 2. — (a) All installations open to public service must receive all messages sent by stations under the control of any Ministry or by any of the National Telegraph offices, provided that the regulations established by each administration regarding the radiograms which may go over their lines are complied with at the original stations from which the messages are radiated.

(b) Foreign vessels under the flag of a country which has not adhered to the London Convention will be allowed to communicate with Argentine coast and stationary ship stations, provided the agents representing the company owning such foreign ships ask for the extension of this privilege and fulfil all the requirements established by the present Regulations and by the London Radiotelegraphic Convention.

ART. 3.—Radiograms will be transmitted in the order of priority established by the Law on National Telegraphs and the Radiotelegraphic Convention, namely:—

(a) Distress calls have absolute priority upon any other communication; then follow:—

(b) Service notices of whatever origin when referring to "the Safety of Life at Sea" or containing information of an urgent character for navigation.

(c) Messages from the Executive Government.

(d) Service notices from the Radiotelegraphic stations.

(e) Messages from the Ministry of Marine, its dependencies and its fleets.

(f) Service notices from the shipping companies.

(g) Private messages.

ART. 4.—In accordance with Art. 101 of the Law on National Telegraphs, messages belonging to the same category will be transmitted by the station of origin in the order in which they are delivered to this station, and by the relay stations, in the order in which they are received.

ART. 5.—In accordance with Art. 102 of the Law on National Telegraphs, private messages stamped as urgent in the "telegraph" system,

should have priority in transmission, even upon messages of a superior category not stamped as urgent.

ART. 6.—Any radiogram referring to the internal service of a fleet, squadron or division in march, will be considered as urgent and transmitted accordingly.

ART. 7.—Every official unprepared radiogram or telegram sent by the Marine officers with authority to do it, will be signed with the corresponding telegraphic address, and such messages will be legalised outside their text with the seal and signature of the competent officer on land or on board.

ART. 8.—The following is a list of Marine Officers who are authorised to send unprepared radiograms and telegrams, according to the Navy Disciplinary Regulations:—

Secretary-General of the Ministry.

Chief of the Radiotelegraphic Department.

Chief of the Hydrography, Lighthouses and Buoys Department.

Inspector of the Marine Ministry's Dependencies in Tierra del Fuego and Cabo Virgenes.

Director-General of Personnel.

Director-General of Material.

Director-General of Administration.

Prefect-General of Ports.

Prefects of Maritime and River Zones.

Director of the Naval School.

Director of the Training School.

Director of the Mechanics School.

Chiefs of Fleets, Divisions, Squadrons, Light Squadrons or Groups.

Chiefs of Staff of Squadrons and Divisions.

Chiefs of Shipyards and Maritime Zones.

Chief of the Aviation Grounds in "Fuente Barragán."

Commanders of Ships.

Commander of the Marine Depot (*Depósito de Marinería*).

Command of Coast Artillery and "Martín García."

Managers of Coast Radiotelegraphic Stations.

Managers of Lighthouses and Director of the "Año Nuevo" Observatory, when addressing the Chief of Hydrography, Lighthouses and Buoys, or the sectional chiefs in his jurisdiction.

Sub-Prefects and their Assistants when addressing the Prefect-General or the jurisdictional Prefect.

The lists of officers belonging to other branches of national service and who have authority to forward unprepared messages will be communicated to the Radiotelegraphic Offices when necessary.

ART. 9.—The Manager of a station may demand from any sender of a radiogram proof of his identity before transmitting the message, acting in accordance with Arts. 82 and 83 of the Law on National Telegraphs of 1875.

ART. 10.—In order to improve the service and with a view to regulate the exchange of radiograms between units of the Navy, coast stations, and foreign ships—strictly following the regulations established by the London International Radiotelegraphic Convention of 1912—the Radiotelegraphic Stations belonging to the Navy—whether opened or not to the public—will act in the way hereinafter detailed to make their calls, answers, transmissions, requests of rectification, repeats and notices of reception, viz.:—

1. Calls.

Every call is made up by the sign — • — • — followed by the letters of the

station to be called, repeated three times, and by the word "de" (— • • • •), followed by the call letters of the calling station repeated three times.

Example of a Call.—Station LIA calls station LIC thus: — • • • • — LIC LIC LIC — • • • • LIA LIA LIA.

2. Answers.

The station that is being called answers thus: The sign — • • • • — followed by the call letters of the calling station, repeated three times; then the word "de" followed once by the call letters of the called or answering station, and ending with the sign — • • • • (invitation to transmit).

Example of an Answer.—Station LIC answers its call to station LIA inviting the latter to transmit its communication, thus: — • • • • — LIA LIA LIA — • • • • LIC — • • • •

3. How to Transmit a Radiogram.

The following are the elements in which is divided every radiogram:

1. Sign of attention — • • • • —
2. Preamble.
3. Supplementary Service instructions, if any.
4. Address.
5. Text of the radiogram.
6. Signature.
7. Signal of end of message • • • • —
8. Call letters of the transmitting station.

If there are several radiograms to transmit, these letters will be sent only after the last message.

The *Preamble* of a radiogram is composed as follows:—

- I. The word "Radio."
- II. Class of the radiogram.
- III. Category of the radiogram. (Class and category are expressed by a group of letters called *prefix*.)
- IV. Name of the office of origin.
- V. Number of the radiogram.
- VI. Number of words.
- VII. Date and hour in which the radiogram was received for transmission.
- VIII. Service instructions.
- IX. Sign — • • • • — (Double hyphen).

Supplementary service instructions are those which are transmitted upon request from the sender, and are charged for.

The following order will be observed in the transmission of every radiogram:

Preamble:

1. Sign of attention — • • • • —
2. The word "Radio."
3. Class of the radiogram.
4. Category of the radiogram.
5. Name of the office of origin.
6. Number of the radiogram.
7. Number of words.
8. Date and hour in which the radiogram was received for transmission.
9. Service instructions:
10. The sign — • • • • —

Supplementary Service Instructions:

11. Supplementary service instructions (if any).
12. The sign — • • • • —

Address:

13. The address (which will have at least two words).
14. The sign — • • • • —

Text:

15. The text of the radiogram.
16. The sign — • • • • —

Signature:

17. Signature.
18. Signal of end of message • • • • —
19. Call letters of the transmitting station.

Examples.—1. At 8.15 a.m. of the 15th of a month was delivered at the TORO station a radiogram for transmission, as follows: Lopez Sarmiento 667 Buenosaires. Send by fast freight 10 cases Viscosine oil. Suárez.

The above radiogram will be transmitted in the following order: — • • • • — Radio (prefix of class and category) TORO. 175 13 15 8.15 m. — • • • • — López Sarmiento 667. Buenosaires — • • • • — Send by fast freight 10 cases Viscosine oil — • • • • — Suárez — • • • • — LMP.

2. The Radiotelegraphic installation of "Dársena Norte" receives the following message on the 25th at 8.15 p.m. from Moron for Benítez, steamship Rawson: On arrival you will find letter and documents asked for. Rodriguez. This radiogram will be transmitted thus: — • • • • — Radio (prefix) Morón 16 14 25 8.15s. — • • • • — Benítez Steamship Rawson — • • • • — On arrival you will find letter and documents asked for — • • • • — Rodriguez — • • • • — LIA.

3. Example of a radiogram from the ship Cabo Corrientes, on the 15th at 3 p.m., to be transmitted to Berlin, via Monrovia, and reading: Schroeder Umlandstrasse 35 Berlin. Send motor type DRS 10 HP. Wagner. This message will be transmitted thus: — • • • • — Radio (prefix) Cabo Corrientes 25 11 15 3 s via Monrovia — • • • • — Schroeder Umlandstrasse 35 Berlin — • • • • — Snd motor type DRS 10 HP. — • • • • — Wagner — • • • • — LMO.

4. Notice of Reception.

When the receiving station receives a radiogram and has verified the number of words stated in the preamble, notice of reception must be given in this form:

"Call letters of the transmitting station followed by the word *de* (from) followed by its own call letters. Then the letter R, the number of the radiogram and the sign to indicate end of transmission • • • • — or end of work • • • • — as the case may be.

Example: — • • • • — LIA de LMX R 76 • • • • —

5. How to ask for a "Repeat."

The method to ask for a repeat will be the following:—

"The characteristics of the transmitting station will be sent followed by the word *de* (from), and then by the characteristics of the receiving station, and the combination QTA followed by the number of the radio."

Example: — • • • • — LIA de LMX QTA 77 — • • • • —

If only a part of the radiogram is to be repeated, the message will be: — • • • • — LIA de LMX QTA 78 desde (from) — • • • • —

Should the receiving station have any doubt as to the radiogram received or the number of its words, a rectification may be requested thus:—

"Sign of attention — • • • • —; call letters of the transmitting station, once; the word *de* (from): call letters of the receiving station; the combination QTC; the number of the radiogram to be rectified and the signal — • • • • —

Example. LMX asks from LIA the rectification of radiogram 71: — • • • • — LIA — • • • • — LMX QTC 71 — • • • • —

Station LIA answers: —●—●—●— LMX
—●—●—●— LIA QTC 7 1 r z p 2 v w k r ●—●—●—

Here the letters and figures r, z, p, 2, v, w, k, r are the initial letters of each word and the first figures of each number.

6. How to Express the Number of Words.

When the actual number of words signalled is not the same as the number of words charged for, the fact should be expressed as a common fraction in which the numerator will indicate the number of words charged for and the denominator the actual number of words transmitted.

Take as an example the following radiogram: Alvarez Calle Corrientes 725 Buenosaires. Ship immediately: 100 litres benzine, 5 kilograms oakum, 5 kilograms Viscosine oil Suárez 22/18 (22—●—●—●— 18).

The real number of words in the message is 18, but the three punctuation marks and the underline are counted and charged as words.

7. How to give the Date and Hour.

The date and the hour will be indicated by two groups of figures: the first group will represent the date of the month, and the second the hour and minutes followed by the letter *m* or the letter *s*, as the case may be, meaning *before noon* and *after noon*, respectively.

For instance, in a message received for transmission the 15th of the current month at 4.36 p.m., this information will be given thus: 15 4.36 s.

8. How to Use the Sign —●—●—●—

Hereafter the sign —●—●—●— will be used to represent the double dash (=), and not as heretofore to represent the letter *elle* (*ll*). This letter *ll* will be represented from now on by two consecutive *elles* (*ll*) (●—●—●— ●—●—●—).

9. How to Request a Station to Wait.

When a coast station is not ready to receive a number of radiograms after the preliminary communications from a ship, as detailed in Art. XVIII of the Rules annexed to the London Radiotelegraphic Convention of 1912, the land station will have to instruct the ship to wait, and such instructions will be communicated in the following manner:
—●—●—●— LMO —●—●—●— LIA ●—●—●—●—
—●— 50 ●—●—●—●— 10 ●—●—●—●—

This means that the station LIA acknowledges receipt of communication from station LMO, and using the service TR notation informs LMO that it has 50 words to communicate, and begs the ship station to wait ten minutes. In these communications the figures will be transmitted using the abridged notation.

10. Use of TR Notation.

Service communications will be preceded by the TR notation.

ART. II.*—When the text of a radiogram is totally or partially in plain language, the following information will be given in the radiogram:—

1. Total number of compound words as a basis for the charge.

2. Number of plain words in plain language or with a conventional meaning.

* This article and the article following would appear to be intended to apply rather to purely Argentine working, as they seem inconsistent with the provisions of the International Telegraph and Radiotelegraph regulations.

3. Number of groups of figures or letters expressed thus:

20/12/6.

This rule applies specially:—

(a) When a radiogram in plain language contains words of more than 15 letters (international system of counting words) or more than 7 syllables (according to our national rule).

(b) When a radiogram in code language contains words with more than 10 letters.

(c) When the radiogram contains groups of figures or letters of more than five characters.

ART. 12.—A radiogram must not contain more than 100 words. If the sender needs more words he must divide his communication in as many messages as necessary to comply with the above rule, and these radiograms will be transmitted alternatively with those from other senders presented for the next turn.

Official, unprepaid telegrams must not contain more than 50 words.

ART. 13.—(a) Radiotelegraphic messages transmitted, relayed or received will be kept in the utmost secrecy, as well as the note books traffic sheets, reports and liquidations of accounts. It is forbidden to divulge the contents of communications intercepted during service hours, even if they do not affect the national public service or the naval service.

(b) If an intercepted radiotelegram contains damaging statements affecting national interests on land or at sea, the information must be communicated at once to the superior of the operator picking up the message, and this operator must keep a memorandum of the text and address of the radiogram concerned.

ART. 14.—It is the duty of every radiotelegraphist to communicate without delay to his superior the contents of intercepted radiograms containing excitations to revolt or affecting the safety of the nation. This information must be transmitted by the superior officer to a competent authority.

ART. 15.—Radiotelegraphic communications, like ordinary telegrams, are confidential; therefore, persons not belonging to the staffs shall not be admitted into the stations.

ART. 16.—In cases referring to the Radiotelegraphic service, not covered by these regulations, the international radiotelegraphic conventions and the Law on National Telegraphs will apply. But if a rule or regulation is not found, the case must be submitted in consultation to the nearest (superior) officer or to the Radiotelegraphic Department.

To ensure a good service it is the duty of coast stations to give to ship stations all the information they may require.

ART. 17.—Radiograms will be delivered following the rules contained in Art. 32 of the Law on National Telegraphs.

SUB-SECTION 4.

CHIEF OF THE PUBLIC MARITIME RADIO-TELEGRAPHIC SERVICE.

ART. I.—The Secretary - General of the Ministry of Marine shall have under his control the Public Radiotelegraphic Maritime Service and his duties will be as follows:—

(a) He shall supervise all coast stations and ship stations after installation, both of national and foreign register, calling at national ports, and shall also supervise all coast stations, as prescribed in Article 2 of Law 9127.

(b) He shall control the service of the said stations and will draft the regulations for same, taking care that the rules herein established and the International Conventions accepted by the National Government are duly fulfilled.

(c) He shall see to it that all regulations concerning rates, discounts and reimbursements, as well as any others that may be later on prescribed by the Post and Telegraph Office regarding the requirements of radiograms relayed to the National Telegraph lines are faithfully complied with.

(d) He shall forward to the Office of Posts and Telegraphs all claims made to the Prefect-General of Ports by Steamship Companies, ship captains or passengers referring to rates, discounts and reimbursements.

(e) He shall issue through the Office of the Prefect-General of Ports the permits for the erection of wireless on board those ships which may have obtained leave to do so in accordance with these Regulations.

(f) He shall issue licences to the wireless telegraphists operating at all stations working within the Maritime Zone, so soon as the conditions affecting such licences have been fulfilled in accordance with these Regulations.

(g) He shall cancel such licences and permits granted to stations and operators within the Maritime Zone as it may, for a good reason, be found necessary to withdraw.

(h) He shall enforce, through the Office of the Prefect-General of Ports, the payment of all fines imposed on shipping companies or ships, and shall direct the deposit of the said fines in the National Bank to the order of the Director of Posts and Telegraphs.

(i) He shall have it in his power to authorise the installation of wireless by private individuals or corporations within the Maritime Zone in accordance with Chapter II, Sub-section 1, Art. 5.

ART. 2.—The head of the Public Maritime Radiotelegraphic Service shall act jointly with the Director of Posts and Telegraphs in the following matters:—

(a) In all matters referring to wireless stations installed on the Maritime Zone;

(b) In all matters referring to rates, discounts and reimbursements of the Public Radiotelegraphic Maritime Service in order to obtain a monthly settlement of accounts by the shipping companies or ship captains with the Office of Posts and Telegraphs in conformity with the schedules prepared by the latter.

(c) In the investigation of any questions that may arise for consultation from the Wireless International Service. In all such cases, the Office of Posts and Telegraphs shall communicate with the foreign administrations and authorities concerned.

ART. 3.—The Director of Posts and Telegraphs shall deal directly with the Secretary-General of the Ministry of Marine in all cases relating to the Maritime Radiotelegraphic Service.

ART. 4.—The necessary instructions to give effect to the provisions of Art. 1, paragraph (c), and all other regulations concerning the internal management of the radiotelegraphic stations in this jurisdiction, will be issued through the Department of Radiotelegraphic Service. These instructions shall be communicated to the stations by means of private circulars.

SUB-SECTION 5.

THE GENERAL OFFICE OF THE PREFECT-GENERAL OF PORTS.

ART. 1.—The duties of the Prefect-General of Ports will be as follows:—

(a) He shall give effect to the provisions made in Articles 4, 5 and 6 of Law 9127 and shall direct the deposit at the Bank of the "Nación Argentina" of the fines imposed for the non-fulfilment of said provisions. The money so deposited must be placed to the order of the Director of Posts and Telegraphs.

(b) He shall receive from shipping companies, captains or passengers all complaints regarding unsatisfactory service in the coast and ship stations, and shall forward them to the head of the Maritime Radiotelegraphic Service.

(c) Should any complaints be made upon the arrival in port of any vessel, the Prefect shall collate the evidence and forward it to the head of the Naval Radiotelegraphic Service, and he shall act in the same manner should the complaints be made in writing.

(d) He shall prevent the departure of any ship which may have failed to make the necessary deposit at the National Bank (to the order of the Director of Posts and Telegraphs) of the fines imposed in accordance with article 6 of Law 9127.

(e) Both upon the arrival and departure of merchant ships the prefect shall have the wireless installations inspected in order to ascertain whether they are in perfect working order and whether the power of the apparatus is that fixed by Law 9127.

ART. 2.—The General Office of the Prefect-General of Ports will refer all matters concerning ship stations to the Director of the Public Maritime Radiotelegraphic Service.

ART. 3.—Besides the inspection and control of ship stations in territorial waters and on craft of all register the general office of the Prefect-General of Ports must attend to the following:—

(1) The dismantling of the transmitting apparatus of the wireless installation as soon as the ship has moored or anchored.

This precaution could be dispensed with, with the consent of the Maritime authority, in the ports of the Southern Coast and in river ports, where no radiotelegraphic land stations are in existence.

(2) He shall ascertain whether the wireless operator or operators have licences corresponding to the installation they are working, in conformity with Article X of the Service Regulations annexed to the London Convention.

(3) In such cases as those covered by Article XII of the Service Regulations above mentioned, the Prefect-General of Ports shall act jointly with the Director-General of Supplies of the Ministry of Marine in order to give effect to the provisions of the said Article.

ART. 4.—First contraventions of the provisions of Art. 5, paragraph 1, will be recorded by the General Office of the Prefect-General of Ports, and each of those following the first will cause a fine of one hundred pesos, national currency.

SUB-SECTION 6.

COAST STATIONS.

Under the Control of the Head of the Public Maritime Radiotelegraph Service and Open to Public Service

ART. 1.—The internal service of these stations will be subject to the provisions of these Regulations and those that may be brought into force subsequently.

ART. 2.—Coast Stations not open to public service may or may not be shown in the Official Nomenclature as deemed expedient by the Ministry of Marine.

ART. 3.—Radiotelegrams must be deposited by the public at telegraph offices, but radiotelegraphic coast stations subject to the Ministry of Marine will receive direct, and within the regulation hours telegrams presented by the public at such stations when there does not exist a telegraph office in the locality or in the event of such telegraph office being without communication with the remainder of the system.

Exception from this provision is made for private radiotelegrams from the personnel of the Navy and addressed to stations of the Ministry of Marine, and such radiotelegrams, whether or not there is a telegraph office at the place of origin, may be despatched on prepayment of the relative tariff from any radiotelegraph coast station under the control of the said Ministry.

The radiotelegrams referred to in the first paragraph shall follow this route, namely:—

(a) Messages originating from a telegraph office shall continue transmission by the telegraph route as far as the place where is situated the radiotelegraph coast station that is to transmit them to a ship or to the coast station which is nearest that of destination.

(b) Messages handed in by the public at coast stations shall be transmitted by wireless route to the nearest telegraph office having expeditious communication, and thence by the telegraph system to the point of destination or to the other coast station that is to transmit them to the ship station.

(c) Radiotelegrams to ship stations that are within the range of the coast stations from which they originate will be interchanged direct.

With regard to radiotelegrams deposited by the public at coast stations, and destined for a place in the interior of the country or abroad, and those messages which, owing to interruption of the telegraph line with the point of destination, are handed in at a telegraph office for transmission by wireless route, will be accepted only conditionally.

ART. 4.—Coast stations will accept and retransmit traffic handed over to them by the National Telegraphs, when such traffic cannot reach its destination in due course, by reason of interruption or congestion of its lines. Either of these two circumstances will be communicated directly by the chiefs of the District to the Officers in Charge of the stations, who will also be advised of the extent of the interrupted sector, or in case of congestion, the number of messages to be retransmitted by the wireless route in order to normalise the traffic. In case of lack of communication between the telegraph office and its head office, the Chief of the former will directly request the co-operation of the interchange radiotelegraph station, making known this circumstance.

In case of interruption or congestion of the lines south of Bahia Blanca, messages from and for Punta Arenas will be retransmitted by stations of the radiotelegraph system only in the event of their destination or origin being any of the offices comprised between Bahia Blanca and Ushuaia.

ART. 5.—If, although there exists at the place where the message is handed in a National Telegraph Office, having efficient communication, or when the message could be retransmitted to destination by the telegraph lines, the sender should, nevertheless, prefer the radiotelegraph route, over the greater part of its transmission, the message will be charged double the ordinary tariff collected by the National Telegraphs in respect of inland telegrams, without prejudice to other taxes that may be applied, calculated according to general rules.

ART. 6.—The men of the Navy shall be able to make use of the wireless system over the greater part of the route from any radiotelegraph station under the control of the Minister of Marine on payment of double the ordinary tariff as mentioned in the previous Article.

Crews and passengers of mercantile vessels of Argentine registry will enjoy the same privilege on payment of the double coast tax.

ART. 7.—Coast stations will not accept from the public messages in secret languages unless they have been previously visé by the Chief of the Telegraph Office of the place.

ART. 8.—Messages for the "Press, Stock Exchange and Commercial Centres," will not enjoy the half-rate concession that applies to transmission over the National telegraph lines, if the sender should prefer the radiotelegraph route.

ART. 9.—Public messages received by radiotelegraph stations will be delivered, without exception, to the nearest Post Office for distribution.

ART. 10.—The prefix "DPX" will be employed for those public messages whose senders have paid the double tariff or coast charges indicated in Articles 5 and 6. Such messages will have priority of transmission by the wireless route over other public messages.

ART. 11.—The hours which will be in force at coast stations, as regards attention to the public, will be from 8 a.m. to 8 p.m., both in winter and summer.

ART. 12.—For the supervision of the radiotelegraph service and control of the fulfilment of everything specified in the International Radiotelegraph Convention of London, and of the present regulations, on the part of all radiotelegraph stations, whether ship stations or coast stations in the maritime zone, the under-mentioned are designated as stations of control:

Dársena Norte will control the port of Buenos Aires and the vicinity.

La Paz will control the port of Rosario and the vicinity.

Rio Santiago will control the port of La Plata and the vicinity.

Puerto Militar will control its own port and Bahia Blanca and the vicinity.

Cabo Virgenes will control the south coast.

ART. 13.—In the territories of Santa Cruz and Tierra del Fuego the control over the radiotelegraphic service will be exercised by an inspector appointed by the Ministry of Marine.

ART. 14.—For the purpose of accounts, the coast station will be considered as the terminal station in respect of radiotelegrams emanating from the national radiotelegraph service for ship stations, and shall be considered as stations of origin for those messages emanating from ships.

ART. 15.—Coast stations shall accept with absolute priority distress messages made by ships and shall transmit them as "Urgent" messages over the land system.

ART. 16.—Coast stations shall not despatch any official radiotelegram by the lines of the National Telegraphs emanating from vessels or departments of the Ministry of Marine which can reach its destination without such requisite.

Exception is made as regards official urgent radios which may be delayed by interruptions in the radiotelegraph transmission due to atmospheric perturbations or other causes. Nevertheless, according as services may allow, they will be transmitted by the wireless route.

ART. 17.—When a vessel of the National Navy shall transmit the "Interruption" signal — • • • • • repeated several times and followed by her call signal, national merchant vessels and coast stations shall suspend all communication immediately, excepting in cases of shipwreck.

This signal of interruption which is designated as "Naval Service," shall only be used on the order of the commander of the vessel and shall be employed only in urgent cases that do not permit the normal service wait.

ART. 18.—Apart from cases of shipwreck, the station of Dársena Norte has precedence over the others. When that station transmits the interruption signal, all land stations and ships shall suspend their communications to enable the Station of Darsena Norte to work without interruption.

ART. 19.—The radiotelegraphic coast stations of the State performing the service of the National Telegraphs shall also observe an internal time table between themselves for the interchange of radios of the public service.

ART. 20.—All national ship and land stations shall suspend their communications during the time that the stations designated for the purpose are transmitting the "Top Radiotelegrafico."

ART. 21.—This decree to be communicated, published, etc., etc.

SUB-SECTION 7.

NATIONAL WARSHIP STATIONS.

ART. 1.—Warship and coast stations shall use for official messages the maximum wavelength possible for their aeriels, and should they have to transmit messages to Argentine merchantmen or to foreign merchant steamers they must use the wavelengths specified by the London Convention and by these Regulations.

ART. 2.—In order to avoid difficulties in the general radiotelegraphic service arising from the use by and between Navy units employing Wireless, and which work with the normal wavelength (600 metres) — thus producing interruptions that prevent the reception of other radiograms—this method will be followed, namely:—

For Wireless communications in general, between Navy units, their station shall employ the following wavelengths:—

1,000 METRES: Ships *Moreno, Rivadavia, General San Martín, General Belgrano, Pueyrredon, Garibaldi, Buenos Aires, 9 de Julio, Presidente Sarmiento, Pampa, Chaco.*

450 METRES: Ships *Almirante Brown, Libertad, Independencia, Paraná, Rosario, Patria, Córdoba, La Plata, Catamarca, Jujuy, Entre Ríos, Misiones, Corrientes, Guardia Nacional, 1º de Mayo, Ministro Ezcurra, Alférez Mackinlay, Ona, Querandi, Azopardo, Piedra Buena, Vicente Fidel López, Uruguay, and Gavotta.*

2. When the distance between ships does not allow of the establishment of wireless communication with the wavelength mentioned above (No. 1) the operator shall use the efficient wavelength that his apparatus may permit.

3. The normal 600 metres wavelength shall be used exclusively for general service between ships and land stations, national or foreign.

4. After the radiotelegraphic communication is established by any means as mentioned above (Nos. 1 and 2), the operator shall with the minimum power required for obtaining effective communication in accordance with the provisions of the London Radiotelegraphic Convention.

5. The syntonisation of the radiotelegraphic stations on board ships of the Navy, shall be controlled and regulated by the Radiotelegraphic Service Department, in accordance with the wavelengths established by Art. 1, and taking into consideration the normal wave of 600 metres.

SUB-SECTION 8.

WIRELESS ON MERCHANTMEN.

ART. 1.—All merchant vessels, whether mechanically propelled or otherwise, carrying fifty or more persons (passengers and crew) must be fitted with a wireless installation in perfect working order, except in the cases referred to in Articles 4, 5 and 6 below.

The above applies to all craft in similar conditions entering or leaving Argentine ports.

ART. 2.—Wireless apparatus in charge of an efficient operator must have at all times a transmitting power of no less than 200 kilometres for river craft and of no less than 500 for sea craft.

ART. 3.—No ships will be allowed to clear when the above provisions have not been duly complied with, and should captains or ship masters endeavour to avoid or contravene this rule the Superior Port Authority can impose a fine of not less than 1,000 pesos and not exceeding 5,000. Those penalised in that way can appeal to the Federal Court having jurisdiction on the locality where the fault has been committed. The fine will be doubled in cases of repetition of the offence.

ART. 4.—Ships exclusively navigating the rivers of the Republic are exempted from the obligation of carrying wireless on board, but those plying between Argentine and Uruguayan ports on the River Plate and those employed in the coasting trade must carry radiotelegraphic installations.

ART. 5.—The following are the exceptions to the rule established by Article 1:—

(1) Those ships which only by accident or under exceptional circumstances carry fifty or more passengers either because the captain has been obliged to get extra help in order to replace the sick members of the crew, or because he has taken aboard the passengers and crew of some vessel in distress.

(2) Those ships on which, by reason of the route they follow or because of the conditions on which they set out to sea, it may be considered that the carrying of a wireless installation would be useless and superfluous.

(3) Those ships where the number of passengers may be raised by exceptional or accidental circumstances to 50 or more, owing to their having received on board these additional passengers in the course of the voyage for the purpose of transhipment, with the additional proviso that such vessels do not go farther than 150 miles from the nearest coast.

(4) Sailing ships of primitive construction, such as pontoons and lighters, when it is impossible to fit them with wireless.

ART. 6.—Vessels which have started their voyage without meeting the requirements of these regulations cannot be observed or attended to if, by reason of bad weather or through *force majeure*, they are compelled to seek refuge in Argentine ports.

ART. 7.—All foreign ships carrying wireless installations are divided into three classes according to the classification made regarding ship stations in Article XII of the Regulations annexed to the Radiotelegraphic Convention signed in London on July 5th, 1912. These classes are:—

FIRST CLASS.—Vessels carrying a permanent wireless service.

All vessels fitted to carry 25 or more passengers are included in the *First Class*.

(1) If their average speed be of 15 knots or more.

(2) If they have an average speed of over 13 knots; but only provided they carry 200 or more persons (passengers and crew) and provided also that they traverse a distance of more than 500 nautical miles between two ports of call. These ships, however, may be classified under the second class provided that they maintain a continuous watch.

SECOND CLASS.—Vessels having a limited wireless service.

Those ships fitted to carry 25 or more passengers which for some other reasons may not have been included in the first class are included in this second class.

All ships of the second class must, whilst at sea, keep continuous watch during seven hours every day, and watch also for ten minutes at the beginning of each of the remaining seventeen hours.

THIRD CLASS.—To this class belong those ships, national or foreign, carrying a wireless installation without any fixed working hours or not included in the first and second classes.

The owner or builder of a ship included in the second or third class has the right to demand that in the certificate of safety issued to him mention be made of the fact that the ship belongs to a higher class, provided the vessel fulfils the requirements laid down for the higher class.

ART. 8.—National and foreign ships carrying wireless must keep a constant watch in the following cases:—

(1) Passenger ships running to Montevideo.

(2) All ships belonging to the first class.

(3) Ships belonging to the second class, whenever they are at a distance of over 500 miles from the nearest coast.

(4) (a) Ships carrying more than 50 persons and which, by reason of their movements, are obliged to navigate at a distance of over 1,000 miles from the nearest coast.

(b) Fishing craft, including whalers, on board of which wireless telegraphy must be carried, are not obliged to keep a continuous watch.

(c) The continuous watch above referred to must be carried out by two or more first-class qualified telegraphists, as provided for in Article X of the Regulations annexed to the Convention.

ART. 9.—Any ship which must carry wireless and which is classified in the first or second class must have an emergency-installation in accordance with Article XI of the Regulations annexed to the Radiotelegraphic Convention.

In every case, the emergency installation shall be placed in its entirety on the upper deck of the ship and should be located as high up as possible.

The emergency installation must have a source of energy of its own, must be of such a nature that it can be set in motion very rapidly, and must be capable to work for a minimum of six continuous hours and possess a range of 150 kilometres.

This emergency installation is not required in the case of those ships whose *normal* installations fulfil all the requirements demanded by this Article (as enumerated in the preceding clause).

The licence referred to in Article IX of the Regulations annexed to the International Radiotelegraphic Convention cannot be granted if the installation fails to comply with the requirements demanded by the said Convention and by the present regulations.

ART. 10.—All points raised in the Radiotelegraphic International Convention and its Regulations which affect ship stations, the transmission of messages, and the issue of certificates to wireless operators, are governed by the following:—

(1) The Rules laid down in the above-mentioned Convention and its Regulations, as well as all the amending Regulations which may from time to time be substituted for them.

(2) The present Regulations whenever their provisions can be considered as additions to the above.

SUB-SECTION 9.

RULES FOR WIRELESS INSTALLATIONS ON NATIONAL MERCHANTMEN.

ART. 1.—All Shipping Companies whose vessels are included in the Regulations laid down in Wireless Law No. 9127 must obtain a permit from the Ministry of Marine and through the Prefect-General of Ports for the installation of wireless stations on their ships.

ART. 2.—Wireless stations on national ships devoted to the conveyance of passengers will be classified as belonging to the first class, and wireless stations on cargo boats will be included in the second class (Article XIII of the Service Regulations annexed to the Wireless Convention).

When Shipping Companies apply for permission to install wireless in their vessels they must indicate the class occupied by such vessels, and this classification must be verified by the Office of the Prefect-General of Ports before forwarding the application to the Secretary-General of the Ministry of Marine.

ART. 3.—As soon as the permit has been granted, and immediately after the stations have been erected on the ship, the company must notify the Prefect-General of Ports, so that the latter may—after previous inspection by the wireless inspector—issue the corresponding licence through the Chief of the Maritime Wireless Service. This licence will be handed over as soon as the charge of 5 pesos (national currency) for the defrayment of expenses has been paid.

ART. 4.—The Ministry of Marine will grant the licence:—

(a) If the wireless installation fulfils all the requirements of the law in the matter of range and also if the installation belongs to a system permitting of its being tuned to the wavelengths specified in the London Wireless Convention, within an approximation of 5 per cent.

(b) If a deposit to the order of the Director General of Posts and Telegraphs has been made in the "Banco de la Nación Argentina" of the amount previously fixed by this office as a guarantee for the exchange of radiograms. This deposit must amount at least to one hundred pesos, national currency.

(c) The depositors shall not dispose of the deposit (as provided in (b)) unless they previously notify the administration that their vessels are going to discontinue their registered service, and that sufficient time has elapsed to effect the final liquidation of accounts for radiograms exchanged.

(d) Stations on board ships from a country with which no agreements have been entered into for the exchange of radiograms (between our stations and its ships), will be subject to the conditions (b) and (c). In this case the deposit must be made, before any service is rendered, by the agents of the shipping company owning the vessel.

ART. 5.—Wireless installations on ships belonging to the national merchant service must be furnished with the following papers:—

- (1) The licence authorising the installation.
- (2) One copy of the London Wireless Convention.
- (3) One copy of the Wireless Law.
- (4) One copy of the Wireless Regulations.
- (5) The Official List of Wireless Stations and alphabetical list of call letters.
- (6) Radiogram forms.
- (7) One copy of the standing wireless rates, which must be kept where it can be plainly seen.
- (8) One slate, placed outside the wireless cabin, so that the names of those stations within range may be noted thereon for the information of the public.

ART. 6.—The stations on board national merchantmen must be disposed in such a way that the State's stations may receive the waves emitted by the former.

ART. 7.—Radiotelegraphists are forbidden to operate in unlicensed stations.

It is their duty to report to the Prefect-General of Ports any tentative to compel them to disregard this prohibition.

ART. 8.—(a) When a "licence" is issued the station receives its call letters, which will be published in the Official List of Radiotelegraphic Stations issued by the Berne International Telegraphic Bureau.

Stations licensed for public service "must not use," not even for private purposes, other call letters than those assigned them by the Director of the Maritime Public Radiotelegraphic Service.

(b) The operators in charge of the stations will be responsible for any infringement of the above provision.

ART. 9.—(a) Operators in charge of public service stations are responsible to the Director of the Maritime Public Radiotelegraphic Service for the fulfilment of the provisions contained in the Regulations in force at the time and in the International Radiotelegraphic Convention.

The manager of a station is the chief of the staff serving in the same, and if it is a ship station the manager is responsible to the ship's captain.

The operator in charge of a ship station owes obedience to the captain, and if the latter gives an order against the rules or the International Convention, the operator has the

right, acting with tact and courtesy, to call the captain's attention to the fact, pointing out to him at the same time how to avoid the infringement of the rules in carrying through the order received.

(b) The operator in charge shall keep a "book of orders of the station," the pages of which must be numbered. It is forbidden to detach leaves from this book and to use erasers on its pages.

A record will be kept in this book of all orders received from officers with authority to issue them, such as the ship's captain, his substitute, the inspectors representing a Prefect of Ports, etc. Every order will be marked with a number, and in a marginal note the operator will state the date and hour in which it was received; also the place, whenever possible.

The book of orders will be considered as an official document jointly with the "watch book" (*libro de guardia*). The two books will be referred to in case of a lawsuit originated from infringement of the regulations or through other causes.

Whenever required by a competent authority this book shall be submitted for inspection.

Opposite the order (to this effect), in a marginal note, the operator will record the date and hour in which he complied with it.

(c) The operator in charge is responsible for the "service" of the station; therefore, he must see to it that all measures are taken to insure the most efficient service the class of the station calls for—as given in the licence issued by the Director of the Maritime Public Radiotelegraphic Service.

(d) Only the operator in charge is responsible for the accounts or bookkeeping of the station and, unless express orders to the contrary are given, he must prepare the balance-sheets and vouchers thereof.

ART. 10.—The operators in charge of a radiotelegraphic station where an emergency station has been installed according to specifications in the Convention, must verify the perfect running of the emergency station before weighing anchor. The experiments to be carried in this case will be purely local, being limited to the test of the generator, the oscillating circuit and the receiving apparatus.

However, if the operator in charge is in doubt as to the range or satisfactory running of the whole set, he may ask any coast station to listen to his call in order to perform any test he may judge necessary. When acting in this way the operator will use the abbreviations given in the international list.

The test will be carried through in this way: the operator will ask for a certain time (*un cierto tiempo*) the transmission of the signal **• • • — •** in order to verify the receiving set; afterwards, the operator will send the same signal using the emergency transmitting apparatus, thus testing its efficiency and the wavelength.

The operator of the station will record in his "watch book" all the remarks suggested by the test and the result of same. If the emergency station is found deficient in some respect, the operator will report to the captain so that he may give the necessary orders to have it repaired and in working order, according to the International Convention.

ART. 11.—When a national merchant ship happens to enter a zone where naval manœuvres are being performed by men-of-war using their wireless, the merchant ship must ask for a licence from the chief of operations to send

her messages to the land stations, and in so doing she must state the approximate time that will be required to transmit the traffic in hand.

In these communications both the man-of-war and the merchant ship will use the prefix "T.R."

ART. 12.—Whenever these Regulations are infringed, information about the facts will be gathered, and in view of the evidence fines will be imposed, according to the national and international laws and regulations governing the telegraphic and radiotelegraphic services. The payment of the fines will not prevent further legal action, as may be required by the nature of the fault.

A "licence" may be cancelled if the findings in the summary show the convenience of so doing.

SUB-SECTION 10.

OFFICIAL CLASSIFICATION, RATES, COLLECTIONS, AND ACCOUNTS IN ALL KINDS OF RADIOTELEGRAPHIC STATIONS.

ART. 1.—To make up and liquidate the accounts concerning radiograms received from the public at the coast stations, the following method will be observed:

(a) If there is no postal or telegraph office in the locality, the money corresponding to this service will be paid to the Post and Telegraphs Treasury through the Administrative Section under the Director-General of the Ministry of Marine.

(b) If there is a postal or telegraph office in town, the payments referred to in (a) will be made to it, daily, the wireless coast station getting a receipt for every remittance.

(c) In places where there is a telegraph office, the coast station shall receive messages from the public when the former is out of connection with the telegram system, and the tolls collected will be paid by the latter to the telegraph office, as stated in (b).

ART. 2.—Radiograms from the personnel of the national Navy and ships belonging to other State services will be exempted of the tolls caused at the State ship and coast stations but not of those corresponding to the land lines.

When such radiograms as those referred to in this article do not use land lines, their transmission will be charged according to the lowest (simple) telegraph rates.

ART. 3.—The personnel of the Navy shall be able to make use, without charge, of radiotelegraphy for affairs of service connected with their functions, providing that the interchange is effected directly between stations of the Navy and without the intervention of any other system of communication. This class of radiotelegram shall bear the prefix "R.S.," and will not be forwarded without the sanction of the officer in command. As regards transmission, they will take priority over the "D.P." radios.

ART. 4.—The collection of tolls on private radiograms from ships of the Navy or other public services is subject to the following rules:—

(a) Radiograms from the personnel mentioned in Art. 2 and those addressed to any of the national wireless stations to be forwarded by land lines to men in the service, are subject to the ordinary telegraph rates and the amount in full must be paid to the operator or chief of the station, just as telegraphic messages are paid for in land offices. The operator will issue in every instance a receipt of the amount collected.

(b) Every day the operator in charge will hand over to the ship's purser the money received for private messages sent out, and the purser will give a receipt of the amount.

(c) The pursers of ships stationed between La Plata and the Buenos Aires ports will pay out every month to the Arsenal Administrative Department the money received from the operators in charge. This payment to be made according to paragraph (a), Art. 1, of this Sub-section.

(d) The same operation will take effect every month in the arsenal and ships anchored in the military port, where the Administrative Department will hand over the money received directly to the Telegraph office at that port.

(e) In the case of ships out at sea, the deliveries of money will take place as stated in paragraphs (c) and (d), the payments to be made within twenty-four hours of arrival at their jurisdictional port, if such arrival occurs after the day fixed for settlement of accounts.

ART. 5.—Any claim arisen from differences in the accounts submitted will be presented by the Director-General of National Posts and Telegraphs to the Chief of the Maritime Public Radiotelegraphic Service.

ART. 6.—Ships and service sections with wireless stations belonging to Ministries (other than the Interior and Marine) will settle the radiotelegraphic accounts according to agreements they will enter into with the Director-General of Posts and Telegraphs.

ART. 7.—Shipping companies will settle monthly their accounts with the Administration of Posts and Telegraphs. The settlements will be made according to the statement of account that the latter office will prepare and forward to every shipping company.

ART. 8.—Telegraph and radiotelegraph rates at present in force are those published in the pamphlet "National Postal and Telegraphic Schedule of Charges" 1917 edition, and in the "Official List" of International Radiotelegraphic Stations.

National stations will apply the rates therein given.

ART. 9.—With the amount of tolls collected in the public service by the State's and National Shipping Companies' stations (which amounts are paid to the Administration of Posts and Telegraphs as provided in these Regulations) the following documents will be submitted: the list of radiograms exchanged with the necessary information to identify them, and the original of every message, sent relayed and received.

These originals will be placed in a sealed envelope, to be opened only by the Administration of Posts and Telegraphs.

ART. 10.—One copy of the list (mentioned in Art. 9) shall be sent in the first five days of every month to the Radiotelegraphic Department, Ministry of Marine. Shipping companies' stations shall forward these lists through the office of the Prefect-General of Ports.

ART. 11.—A separate list will be made of the official radiograms exchanged between the Navy units and between these units and the national coast stations, when the last is their final destination. This list will be sent only to the Radiotelegraphic Department, also in the first five days of every month, and must be accompanied by the originals of the radiograms exchanged (received, relayed, and transmitted) as provided by Art. 9.

ART. 12.—Coast and ship tolls will be liquidated between the Director-General of Posts and Telegraphs and the foreign administrations or companies controlling the stations intervening in the exchange of radiograms, according to Art. XIII of International Radiotelegraphic Regulations.

ART. 13.—The tolls collected on account of public service radiotelegrams exchanged direct between ships owned by the same company shall not be paid to the Administration of Posts and Telegraphs, but, the corresponding list of messages and their originals shall be supplied as provided above.

ART. 14.—The accounts for direct radiotelegraphic exchange between Argentine merchant ships or between Argentine and foreign ships will be settled between the respective companies, and to this effect in each case the receiving station will make the corresponding charge to the transmitting station, but the list of messages and the originals of the messages exchanged will be supplied by the stations on board national ships.

ART. 15.—The Director-General of Posts and Telegraphs shall include in the official list of telegraphic offices the data *re* national licensed coast and ship stations existing in the country, and the list will be kept for reference and consultation by the public at every telegraph office in the Republic. The necessary information to prepare this list—as detailed below—will be supplied by the Ministry of Marine to the Director of Posts and Telegraphs, viz.:—

(a) *Inland and Coast Stations.*—Name, geographical position as shown by the territorial sub-division of the country and longitude and latitude of the place.

Ship Stations.—Name of the vessel, and—if essential—name of the owner or owners.

(b) Call letters. (Every group of call letters must contain three letters and shall be differently arranged for each station.)

(c) Normal range.

(d) Radiotelegraphic system employed and characteristics of the transmitting set.

(e) The several wavelengths employed by the station. The normal wavelength to be underlined.

(f) Class of service rendered by the station (communication with ships, general public correspondence, private correspondence, long-distance public correspondence, special correspondence, exclusively official, etc.).

(g) Service hours of the station.

(h) The time and how the signals are sent out, and the meteorological notices, when the station attends to this kind of service.

(i) Coast and ship rates.

The list will contain, as well, the information communicated to the Berne Bureau relating to radiotelegraphic stations not opened for general public correspondence.

In designing radiotelegraphic stations, the following abbreviations will be made use of:—

PG—Station open to general public correspondence.

PR—Station open to restricted public correspondence.

P—Private station (*Estación de interés privado*).

O—Station open exclusively to official correspondence.

N—Permanent Service Station.

X—Station without fixed hours service.

In cases of homonymy, the name of a ship station will be immediately followed—in the first column of the list—by the corresponding call letters.

ART. 16.—In the counting of words to collect the tolls, the rules given in the regulations annexed to the Petrograd Convention will be followed.

ART. 17.—The originals of public service radiograms and all documents appertaining to same will be safely kept by the Direction-General of Posts and Telegraphs during fifteen months, counting from the month following that in which the originals were received at that office.

ART. 18.—Reimbursements originated by the exchange of radiograms with the State's stations will be settled in accordance with the provisions of the International Telegraphic and Radiotelegraphic Convention.

ART. 19.—In the application of the schedule of charges corresponding to messages issued from or addressed to radiotelegraphic stations established in places where no telegraph office is in existence, such stations will be considered as national telegraph offices and the radiotelegraphic rates will be applied only to messages exchanged with ship stations.

CHAPTER III.

NAVY RADIOTELEGRAPHIC STATIONS SERVICE.

SUB-SECTION I.

STATION'S STAFF—DUTIES AND POWERS.

ART. 1.—The staff in every station will consist of one operator in charge and the number of subordinate trained operators required to keep the watch. The number of these operators will be fixed by the Radiotelegraphic Department.

In case of vacancy or temporary absence from the station of the operator in charge, his place will be filled by the operator of highest category or, between men of the same category, by the senior in the service.

Operators in charge shall depend directly from the signal officers.

ART. 2.—The operator in charge is responsible to the Department or to the signal officers—as the case may be—both for the proper running and upkeep of the station apparatus and for any lack of attention in the performance of the service. The operator in charge, however, may have the responsibility devolved upon the subordinate who was in the watch at the time the breakdown or inattention took place.

ART. 3.—When the station is short-handed the operator in charge will do watch duty as the subordinate, but the former will be at liberty to choose the hours for his watch.

ART. 4.—The hours of watch corresponding to each operator will be fixed beforehand, considering the class of service to be rendered and the number of men on the staff of the station.

ART. 5.—Ship commanders or managers of other public services have authority to increase temporarily the staff of the stations depending from them, when, on account of manœuvres or other similar service, they consider it essential to insure efficient communications.

ART. 6.—To define justly the responsibility attaching to each operator in connection with breakdowns in the apparatus or omissions in the fulfilment of duties, each operator on taking up his watch will sign in the watch book an entry stating the condition in which

he receives the apparatus, the hour of his coming in and all other particulars that may help later on to establish responsibilities. This entry shall be signed also by the operator leaving the work.

ART. 7.—Every time a watch is relieved the operator going out will communicate to his relief all information in his possession concerning the service and useful in the proper performance of the duties.

ART. 8.—When, on account of atmospheric discharges it is dangerous to keep the apparatus ready to work, the antenna shall be connected to earth, and this fact will be recorded in the watch book stating the hour in which the interruption took effect and that in which connection for work was re-established. During the period of interruption, the operator shall test the atmospheric conditions every thirty minutes, and he will reconnect the antenna immediately the discharges cease.

ART. 9.—The managers of special services and the commanders of ships shall see that the archives of radiotelegrams—official and private—are kept in due order and with all the information required; also the stub-book of receipts. To this effect the signal officer or the officers in charge of the bookkeeping will inspect the station with due frequency.

ART. 10.—The *Darsena Norte* station is the "Service Central Station," and upon its call the other stations shall stop their communications unless the messages are *very urgent*, in which case the transmission shall be carried on to the end. "Very urgent" messages are those asking for assistance and those transmitting orders from H.E. the President of the Republic, the Minister of Marine and the commanders of fleets engaged in manœuvres.

ART. 11.—Time service in force for coast and fixed ship stations is as follows:—

Dársena Norte	Permanent (N)
Rio Santiago	" "
Faro Recalada (<i>Recalada</i> <i>Lighthouse</i>)	0900—1100 1400—1600 2000—2400

Pontón estacionario de Prácticos (<i>Stationary Pilots'</i> <i>Pontoon</i>)	" "
Faro Mogotes (<i>Mogotes</i> <i>Lighthouse</i>)	Permanent (N)
Puerto Militar (<i>Military</i> <i>Port</i>)	" "
Comodoro Rivadavia	" "
Cabo Virgenes	" "
Año Nuevo	1800—0600
Rio Grande	0600—1800
Ushuaia	Permanent (N)
La Paz	2400—1200
Posadas	" "
Formosa	" "
Puerto Aguirre	" "
San Julian	Permanent (N)

ART. 12.—Commanders of ships navigating along or towards Argentine coasts will have observed on their "R.T." stations the following hours:—

Ships with three or more radio-telegraph operators. ..	Permanent service.
Ships with two operators ..	0700—1100 1400—1800 2000—2400
Ships with one operator ..	0800—1100 1400—1600 2100—2300

Whenever a complaint is made, a full explanation as to the reasons of delay or other

cause of complaint shall be given, and to this effect a record of the facts will be entered in a special Watch Book. This book will be kept by the operator in charge and viséed by the signal officer. Coast stations may call at any hour the ship they want to communicate with. In case of delay, the coast station will regulate its work so as to pick up the ship station at the first opportunity.

Ship commanders may call at any hour the permanent service stations, but, in normal circumstances, they should arrange their calls to other stations in accordance with the latter's hours of working.

Calls for assistance are to be made at any time they are required.

Stations with intermittent service shall attend an urgent call the moment it is heard, whether or not within their regular service hours.

For the purposes of this Article the hour is four hours later than G.M.T.

SUB-SECTION 2.

GENERAL RULES.

ART. 1.—It is absolutely forbidden to the operators to maintain dialogues by wireless; their conversations will, in every instance, be limited to the subjects strictly essential to render a good service.

ART. 2.—Whenever a radiogram is transmitted with a delay of more than thirty minutes after it was handed in, it shall be endorsed with an explanation of the delay which is to be recorded in the watch book.

ART. 3.—When a station calls repeatedly for another and cannot get an answer in more than five minutes, the fact will be recorded in the watch book and also the object of the call. Other stations within the range of the calling station shall record, as well, the call and the omission to answer it. These records will serve to establish the responsibility for possible delays in the transmission or reception of messages.

ART. 4.—When a station "causes a wait" (*da una espera*) of more than ten minutes, the two stations concerned shall record the fact in their respective watch books, the transmitting station giving the classification of the radiogram it has for transmission, and the receiving station the cause of the "wait."

The transmitting station shall remind every ten minutes the receiving station of its being waiting, and the reminders will continue until the radiogram in hand is transmitted.

ART. 5.—Whenever trouble occurs in the receiving apparatus causing a delay of more than ten minutes, a record of the nature of the trouble will be made in the watch book in order to fix responsibilities. The operator in charge will make a similar record whenever he is unable to answer a call through lack of current in the transmitting set, the burning out of a fuse, or other like accident.

ART. 6.—While two stations are in communication, it is absolutely forbidden to the others to interrupt them by calling out a third station, unless the call is to transmit a "very urgent" radiogram or a "general call" from the flagship. However, even in the cases just mentioned the interruption should be made only at the moment the station that is sending messages completes one of them. When this is accomplished the interrupting station shall give the signal of general interruption and the prefix corresponding to either of the very urgent messages above mentioned, which are to have priority in transmission and reception.

ART. 7.—When a ship moors at a port, Navy yard or dockyard, her wireless plant will be closed after a thorough cleaning of its parts.

ART. 8.—To avoid the damages which are likely to occur in wireless stations of resonant spark, on account of the spark gaps being short-circuited, the electrodes shall be thoroughly cleaned once a week.

The officer on duty shall be present at the cleaning and will see that it is made properly and thoroughly. To ascertain that the operation has been carried through without impairing the efficiency of the apparatus, the officer will remove the mica washers and will see whether—without them—the contact between each pair of electrodes is perfectly uniform both in the copper and the silver discs.

ART. 9.—Radiograms referring to urgent family matters of men in the Navy service, and issued from a Navy ship *Dársena Norte* station, may be sent thence to destination by telephone, if the sender so desires. This will not alter the charges provided the expression "T.C. Naval" follows the signature.

ART. 10.—Arsenal and dockyard commanders shall take care that the radiotelegraph operators under their command attend in the most thorough manner to the clearing and maintenance in good order of wireless apparatus on board ships anchored therein. The same commanders will see to it that the operators practise with reasonable frequency in sending and receiving messages.

ART. 11.—It is the duty of the staff of a ship station anchored in a Navy yard or military zone to serve in the land stations in the neighbourhood. If one of the latter is closed for repairs, the operators shall report for duty at the station on board the ship appointed to replace the temporarily closed station.

When the number of available operators is rather large, the commander of the Navy yard or the military zone will appoint the hours of service corresponding to each operator.

ART. 12.—Complaints referring to misdirected, altered, or delayed radiograms should be forwarded by the sender of the message to the captain of the ship whence it was transmitted.

The complaint must contain the number of the radiogram, the hour of transmission, the receiving station, and the name and address of the addressee.

The ship commander will give the necessary instructions to have the information supplied duly checked and all the papers referring to the case shall be sent to the Secretary-General of the Ministry.

Every complaint must refer to one radiogram only.

SUB-SECTION 3.

SPECIAL BOOK-KEEPING OF THE NAVY STATIONS.

ART. 1.—All coast and ship stations shall forward to the Radiotelegraphic Department Ministry of Marine, in the first five days of every month, two copies of the sheets showing the monthly traffic of both official and public radiograms.

The same stations shall forward, every quarter, a statement of the supplies spent and a requisition of the supplies wanted.

ART. 2.—As often there are divergencies in the international radiotelegraphic service as to the number of words contained in the radiograms sent and received abroad through

stations in national men-of-war, these ships shall forward to the Radiotelegraphic Department, Ministry of Marine, an authenticated copy of every message exchanged between them and foreign stations.

Such copies shall be forwarded immediately after the arrival of ships in home waters, so that the Department will be in advance in a position to answer the Administration of Posts and Telegraphs consultations on this subject.

ART. 3.—In all matters relating to management and book-keeping, independent radiotelegraphic stations shall address direct to the Radiotelegraphic Department.

DECREE NO. 1. OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees

ART. 1.—All restrictions imposed having reference to the use of radiotelegraph installations on merchant vessels are removed.

ART. 2.—Merchant vessels shall not make use of their transmitting apparatus on entering the zone comprised within a radius of five nautical miles of the radiotelegraph stations open to public service, and during such period as they remain in that zone. Nevertheless they shall be able to use their transmitters in case of urgent necessity to make calls for assistance.

ART. 3.—A final period of six months is granted for Argentine merchant vessels to comply with the conditions stipulated by the General Regulations of the Radiotelegraph Service.

ART. 4.—At the General Prefecture of Ports an Office of Radiotelegraph Inspection shall be brought into operation which will see that merchant vessels comply with the stipulations of the International Radiotelegraph Convention of London and the General Regulations as regards the Radiotelegraph Service.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

DECREE NO. 2 OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees:

ART. 1.—Authorises the "Division Servicio Radiotelegrafico" to arrange for the Radiotelegraph Works of the Navy to carry out, on board merchant vessels entering the ports, all work that may be required by the radiotelegraph stations of those vessels.

ART. 2.—On the termination of the work the amount incurred as regards wages and materials with an additional charge of 10 per cent. as compensation for the use of machinery and costs of administration shall be liquidated the amount in question to be paid by the captain or shipowner before the vessel leaves the port.

ART. 3.—The sums collected in this manner shall be paid over by the "Division Servicio Radiotelegrafico" to the Treasury of the General Administrative Authorities, so that in due course they may be paid to the General Treasury of the Nation and credit granted for the items destined for the radiotelegraph stations of the Navy.

ART. 4.—The Radiotelegraph Inspectorate of the General Prefecture of Ports shall make this Decree known to captains and shipowners.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

AUSTRALIAN COMMONWEALTH

(See Maps 54 and 56.)

Including : New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, the Northern Territory of Australia.

THE Government is a Federal Commonwealth Government—the Executive power vested in the Sovereign (acting through the Governor-General), assisted by the Executive Council of seven Ministers of State and such honorary Ministers as may be appointed thereto. The constitution rests on the fundamental law of March 16th, 1898, ratified by the Imperial Parliament of July 9th, 1900, and the Commonwealth was inaugurated January 1st, 1901.

CONTROL AND ORGANISATION.

Originally radiotelegraphy was organised in Australia under the supervision of the Postmaster-General, the Naval Department exercising jurisdiction independently over their own radiotelegraph stations.

By an Order of the Governor-General in Council of June 1st, 1922, the control of wireless services of the Commonwealth was transferred to the Prime Minister's Department with such existing staff as the Prime Minister may require for the economic and efficient working of the service.

The great distances and sparsely-peopled spaces of Australia make the subject of broadcasting one of the greatest importance to isolated settlers. In the early part of 1923 the Postmaster-General invited a Conference of those interested including manufacturers, broadcasting companies, dealers and experimenters whose recommendations were accepted as a basis in the Commonwealth Broadcasting Regulations which came into operation on August 1st, 1923, the most important features being :—

- (1) Broadcasting stations licensed to transmit on one wavelength and to collect subscriptions from all licensed receivers using that wavelength within their range.
- (2) Broadcasting stations must submit a guarantee that satisfactory service will be provided for a period of at least five years.
- (3) A limited number of broadcasting transmitters are to be allowed to operate in any given area. Wavelength and power restrictions being enforced to prevent interference.
- (4) Broadcasting receivers are to be designed only for the reception of one or more given services, the users being required to pay a small annual fee to the Company responsible for the service or services which the instrument is designed to receive.
- (5) The receivers to be of a non-oscillating type and must be sealed so that their wavelength cannot be altered without notification.

There will be no monopoly of any one broadcasting company in any given area, and, where more than one service is available, the purchaser of any instrument can specify which service or services it is desired to receive.

The Amalgamated Wireless (Australasia), Ltd., have begun the re-organisation of the coastal and inland services. A wireless telephone station has been installed at Maria Island, off the Tasmanian Coast, and a valve transmitter has replaced the arc previously used for communication with New Guinea.

ADMINISTRATION.

The Act to Regulate Radiotelegraphy in Australasia was passed in 1905. A number of additions and modifications were introduced by Wireless Telegraphy Acts No. 33 of 1915 and No. 4 of 1919, and this amended text will be found below, it being the extant Governing Decree under which wireless is at present administered.

In 1912 the Commonwealth Parliament passed the Navigation Act, wherein is contained a clause which makes it compulsory for ships trading in Australian waters to be fitted with radiotelegraphic apparatus.

Since March 1st, 1923, the Administration of the Wireless Act has rested with the Postmaster-General's Department.

We append the text of current radiotelegraphic legislation in accordance with the following list:—

- A**—Wireless Telegraph Act, 1905, (No. 8), as amended by Act No. 33 of 1915 and Act No. 4 of 1919.
- B**—Wireless Telegraph Regulations Statutory Rules 1923, No. 97.
- C**—Form of Licence for Coast Station.
- D**—Form of Licence for Ship Station.
- E**—Form of Licence for Land Station.
- F**—Form of Licence for Broadcasting Station.
- G**—Form of Licence for Broadcast Receiving Station.
- H**—Form of Licence for Dealing in Wireless Apparatus.
- I**—Experimental Licence for Transmitting and Receiving.
- J**—Experimental Licence, Receiving only.
- K**—Form of Licence for Portable Station.
- L**—Form of Licence for Aircraft Station.
- M**—Certificate of Proficiency, First Class.
- N**—Certificate of Proficiency of Watcher.
- O**—Statutory Declaration regarding Secrecy of Wireless Communications.
- P**—Extract from Navigation Act, 1912.
- Q**—Regulations under the Navigation Act, Statutory Rules 1921, No. 104.
- R**—Regulations under the Navigation Act, Statutory Rules 1921, No. 132.
- S**—Regulations under the Navigation Act, Statutory Rules 1921, No. 179.

ACT NO. 8 OF 1905.

As amended by the Wireless Telegraphy Acts, No. 33 of 1915 and No. 4 of 1919.)

A 1 *Short Title*—This Act may be cited as the Wireless Telegraphy Act, 1905

2 *Interpretation*—In this Act—

"Australia" includes the territorial waters of the Commonwealth and any territory of the Commonwealth;

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver

3 *Exemption of ships of War*.—This Act shall not apply to ships belonging to the King's Navy.

4. *Exclusive Privileges*.—The Minister for the time being administering the Act shall have the exclusive privilege of establishing, erecting, maintaining and using stations and appliances for the purpose of—

(a) transmitting messages by wireless telegraphy within Australia, and receiving messages so transmitted, and

(b) transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and

(c) receiving in Australia messages transmitted by wireless telegraphy from any place or ship outside Australia.

5. *Licences*.—Licences to establish, erect, maintain, or use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being, administering the Act for such terms and on such conditions and on payment of such fees as are prescribed.

6. *Penalty for Breach of Act*.—(1) Except as authorised by or under this Act, no person shall—

(a) establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy; or

(b) transmit or receive messages by wireless telegraphy.

Penalty: Five hundred pounds, or imprisonment with or without hard labour for a term not exceeding Five years.

Ships fitted with Apparatus for Wireless Telegraphy.—(2) Sub-section (1) of this section shall not, except as prescribed, extend to appliances maintained on any ship, arriving from any place beyond Australia, for the purpose of enabling messages to be transmitted from or received on that ship by means of wireless telegraphy, but all such appliances shall, while the ship is within Australia—

(a) Be subject to the control of the Minister for the time being administering the Act; and

(b) Only be used by his authority or as authorised by the regulations.

Penalty: Five hundred pounds.

7. *Forfeiture of Appliances Unlawfully Erected*.—All appliances erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, shall be forfeited to the King for the use of the Commonwealth.

8. *Search Warrants for Appliances Unlawfully Erected*.—(1) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that any appliance is established, erected, maintained, or used in contravention of this Act or the

regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, he may grant a search warrant to any person.

(2) A search warrant under this section shall authorise the person to whom it is addressed to break and enter any place or ship, where the appliance is, or is supposed to be, either by day or by night, and to seize all appliances which appear to him to be used or intended to be used for transmitting or receiving messages by means of wireless telegraphy.

9. *Proceedings in Respect of Offences.*—(1) Proceedings for any offence against this Act may be instituted in any Court of Summary Jurisdiction, and any person proceeded against under this section may be dealt with summarily or may be committed for trial.

(2) The Court in dealing summarily with any accused person under this section may, if he is found guilty of any offence against this Act, punish him by imprisonment with or without hard labour for any period not exceeding six months, or by a penalty not exceeding Fifty pounds.

10. *Regulations.*—The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters which by this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to this Act.

STATUTORY RULES.

1923. No. 97.

REGULATIONS UNDER THE "WIRELESS TELEGRAPHY ACT 1905-1919."

B I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Wireless Telegraphy Act 1905-1919, to come into operation on the first day of August, 1923.

Dated this 25th day of July, 1923.

FORSTER,
Governor-General.

By His Excellency's Command,
W G GIBSON,
Postmaster-General

WIRELESS TELEGRAPHY REGULATIONS PART I—PRELIMINARY.

1. These Regulations may be cited as the "Wireless Telegraphy Regulations."

2. These Regulations are divided into Parts, as follows:—

Part I.—Preliminary.

Part II.—Licences: Classes and Conditions.

Part III.—Applications for Licences.

Part IV.—Broadcasting.

Division 1.—Broadcasting Stations.

Division 2.—Broadcasting (Receiving) Stations.

Division 3.—Sale of Broadcasting (Receiving) Apparatus.

Part V.—Working of Stations.

Part VI.—Control of communications and Appliances in Emergencies.

Part VII.—Proficiency Certificates for Operators and Watchers.

Part VIII.—Miscellaneous.

3. In these Regulations, unless the contrary intention appears—

"Accredited agent" means an accredited sales agent or an accredited representative of a manufacturer;

"Act" means the Wireless Telegraphy Act 1905-1919;

"Aircraft station" means a station on aircraft operated for the purpose of communicating with other authorised stations;

"Australia" includes the territorial waters of the Commonwealth and of any territory of the Commonwealth;

"Australian ship" means a ship registered in Australia;

"Authorised officer" means any officer thereto authorised in writing by the Minister and includes the Chief Manager;

"Authorised station" means a station in respect of which a licence is issued;

"British ship" means a British ship other than an Australian ship;

"Broadcasting station" means a station on land for the purpose of broadcasting to licensed broadcasting (receiving) stations;

"Coast station" means a station which is established on land or on board a ship permanently moored, and which is open for the transmission and receipt of messages by means of wireless telegraphy between land and ship stations or other coast stations;

"Department" means the Postmaster-General's Department;

"Experimental station" means a station used solely for the purpose of instruction or demonstration in, or investigation into, wireless telegraphy;

"Foreign ship" means a ship other than an Australian ship or a British ship;

"Government message" means a message transmitted on behalf of the Government of the United Kingdom or the Government of the Commonwealth;

"Harbour" includes any harbour properly so-called, whether natural or artificial, or any estuary, navigable river, pier, jetty, or other work in or at which a ship can obtain shelter, or ship or unship goods or passengers;

"International Telegraph Convention" means the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and includes any modifications of the Convention made from time to time;

"International Telegraph Regulations" means the service regulations made under the International Telegraph Convention, and includes any modifications of those Regulations made from time to time;

"Land station" means a station, not being a coast station, established on land for the purpose of communicating by means of wireless telegraphy with other stations;

"Licensed installation" means an installation at a station in respect of which a licence is issued;

"Licensee" means any person to whom a licence has been granted under these Regulations;

"Military signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia, or between one such set of appliances and any other wireless telegraphy or telephone station;

"Minister" means the Minister for the time being administering the Act, and includes the Minister or member of the Executive Council for the time being acting for or on behalf of the Minister;

"Naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph or telephone station, whether on shore or on any ship;

"Portable station" means a station in no fixed location capable of being removed from place to place and being operated in transit for the purpose of communication by wireless telegraphy with other authorised stations;

"Ship station" means a ship (not permanently moored) having installed thereon appliances for the transmission and receipt of messages by means of wireless telegraphy;

"Station" means a station for the transmission or receipt of messages by means of wireless telegraphy;

"Telegraph" means a wire or cable used for telegraphic or telephonic communication, including any casing, coating, tube, tunnel or pipe enclosing the same, and any posts, masts or piers supporting the same, and any apparatus connected therewith, or any apparatus for transmitting messages or other communications by means of electricity;

"Territorial waters" means the territorial waters of the Commonwealth and those of any territory of the Commonwealth, and includes harbours;

"The Chief Manager" means the Chief Manager, Telegraphs and Wireless, appointed by the Governor-General under the Commonwealth Public Service Act, 1902-1918;

"The Radiotelegraphic Convention" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations from time to time;

"The Secretary" means the Secretary, Postmaster-General's Department;

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

PART II—LICENCES: CLASSES AND CONDITIONS.

4. (1) The following classes of licences may be granted and may be evidenced by instruments in accordance with the forms in the schedule to these Regulations:—

- (a) Coast station licences (Form 1);
- (b) Ship station licences (Form 2);
- (c) Land station licences (Form 3);
- (d) Broadcasting station licences (Form 4);
- (e) Broadcasting (receiving) station licences (Form 5);
- (f) Dealers' Licences (Form 6);
- (g) Experimental licences (transmitting and receiving), (Form 7);
- (h) Experimental licences (receiving only) (Form 8);
- (i) Portable station licences (Form 9); or
- (j) Aircraft station licences (Form 10);

(2) Except with the consent of the Defence authorities, a licence (other than a broadcasting (receiving) station licence) shall not be granted to any person who is not a natural-born British

subject or whose father was not a natural-born British subject at the date of that person's birth, or whose mother was at any time a subject of a state with which His Majesty was at war during the war which commenced on the fourth day of August, One thousand nine hundred and fourteen.—

(3) A declaration of the secrecy of commercial naval or military wireless communications shall be made in accordance with the form in the Schedule by all persons actually operating a licensed installation, except a broadcasting (receiving) installation, or having access to wireless communications.

(4) Every licence shall be subject to the provisions of any regulations from time to time made under the Wireless Telegraphy Act, 1905-1919, so far as they are applicable to the licence, and those provisions shall be deemed to be incorporated in the licence.

(5) A licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person, in respect of any injury arising from any act of the licensee or his agents permitted by the licence.

(6) Except with the consent in writing of the Minister or an authorised officer, a licensee shall not assign, sublet or otherwise dispose of or admit any other person or body to participate in any of the benefits of the licence, powers, or authorities granted.

(7) Any notice, request, or consent (whether expressed to be in writing or not) to be given or made by or for the Minister may be under the hand of the Secretary or other authorised officer of the Department being administered by the Minister, and may be served by sending the same by registered letter addressed to a licensee at the usual or last-known place or residence or business of the licensee, and in that case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at that place, and any notice to be given by a licensee may be served by sending it by registered letter addressed to the Secretary at his official address within the Commonwealth of Australia.

(8) A licensed installation shall not without the consent of the Minister or an authorised officer be altered or modified in respect of any of the particulars mentioned in the schedule to the licence.

(9) It shall be a condition of the granting of any licence that the licensee shall not—

(a) Transmit any work or part of a work in which copyright subsists except with the consent of the owner of the copyright; or

(b) Send out news or information of any kind published in any newspaper or obtained collected, collated or co-ordinated by any newspaper, or association of newspapers or any news agency or service except with the full consent in writing, first obtained, of, and upon such payment and conditions as are mutually agreed upon by the licensee and the newspaper, association of newspapers, news agency or service.

(10) Every licensed installation shall be available to the Minister for Defence in case of national emergency.

(11) The issue of a licence by the Minister or an authorised officer under these Regulations shall not relieve the licensee of any responsibility for any infringement by the licensee of any patent for an invention.

5. (1) A coast station licence may be granted in respect of a station, situated in Australia, operated for the purpose of maintaining communication by wireless telegraphy with ship stations, land stations, or other coast stations.

(2) the licensed installation shall be operated by an operator holding the prescribed certificate of proficiency.

(3) The licensee shall transmit messages, by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise:

Provided that signals of distress and messages in connection therewith shall receive priority and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(4) In respect of Government messages the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

(5) The licensee or persons employed by him shall, so far as possible, receive from ships and other stations all requests for assistance and all signals of distress, and shall answer those requests and signals and re-transmit them with the least possible delay to the proper authorities by means of the licensed installation or by any other means in the power of the licensee.

(6) The licensee shall keep the full accounts, records, and registers of all messages transmitted by means of the licensed installation.

(7) Each of the messages shall be accompanied in the registers by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably requires to be shown.

(8) Government messages shall be, in the registers, distinguished from other messages.

(9) The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and in default of any provisions on the subject in the Convention, for such period as is from time to time prescribed by the International Telegraph Regulations and such registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a Statutory or general holiday.

(10) The licensee shall exhibit on the coast station established under his licence a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister for the purpose of enabling the licensee to communicate with other stations in accordance with the Radiotelegraphic Convention 1912.

(11) The certificate of proficiency issued to operators employed in the coast station shall be available for inspection by authorised officers.

6. (1) A ship station licence shall be granted only in respect of a station or an Australian ship for the purpose of communication with a coast station or other ship station.

(2) Every ship station on an Australian ship shall be operated by an operator holding the prescribed certificate of proficiency.

(3) The licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise:

Provided that signals of distress and messages in connection therewith shall receive priority, and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(4) The licensee shall, so far as possible, receive from ships and other stations all requests for assistance and all signals of distress, and shall answer those requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed installation or any other means in the power of the licensee.

(5) The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed installation.

(6) Each of the messages shall be accompanied in the registers by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably require to be shown.

(7) In respect of Government messages the licensee shall charge rates not in excess of half the rates charged to the ordinary public.

(8) Government messages shall be in the register distinguished from other messages.

(9) The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and, in default of any provisions on the subject in the Convention, for such period as is from time to time prescribed by the International Telegraphic Regulations, and the registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a Statutory or general holiday.

(10) The licensee shall cause to be carried on the ship to which the licence relates a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention 1912.

7. (1) A land station licence may be granted in respect of a station for the purpose of communication between the land station and another land or coast station, or such stations as may be approved by the Minister.

(2) The application shall indicate the stations with which it is desired to communicate, and communication with any other station will not be permitted except in cases of distress.

(3) The licensed installation shall be operated by a certified operator or by a competent person who shall be approved by an authorised officer.

(4) Unless specially authorised by the Minister the licensed installation shall not be utilised for conducting commercial traffic constituting competition with the Postmaster-General's telegraph and telephone services.

(5) The licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rate of charge, order of transmission, or otherwise:

Provided that signals of distress and messages in connection therewith shall receive priority, and that the order of transmission of other messages shall be governed by the International Telegraph Regulations.

(6) The licensee shall keep full accounts, records and registers, of all messages transmitted by means of the licensed installation.

(7) Each of such messages shall be accompanied in the registers by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or an authorised officer from time to time reasonably requires to be shown.

(8) In respect of Government messages the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

(9) Government messages shall be in the registers distinguished from other messages.

(10) The licensee shall preserve all used message forms, written or printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention, and in default of any provisions on the subject in the Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and the registers and message papers shall be open to the inspection of the Minister or any authorised officer at the usual or principal place of business of the licensee between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statutory or general holiday.

(11) The licensee shall exhibit on the land station established under his licence a print or copy of the licence certified under the hand of an authorised officer to be a true copy, and also such documents as are directed by the Minister, for the purpose of enabling the licensee to communicate with stations in accordance with the Radiotelegraphic Convention, 1912.

8. (1) A broadcasting station licence or broadcasting (receiving) licence or a dealers' licence may be granted in accordance with the provisions of Part IV of these regulations.

9 (1) Experimenting licences shall be of two classes, namely:—

- (a) For transmitting and receiving, and
- (b) For receiving only.

(2) They may be granted to *bona fide* experimenters, radio clubs, institutes, approved by an authorised officer, and for instructional purposes, or for purposes of scientific investigation of wireless telegraphy or wireless telephony phenomena.

(3) The applicant shall:

(a) Indicate the nature and object of the experiments which he desires to conduct;

(b) Satisfy and authorised officer of his technical qualifications to conduct experiments scientifically, and to adjust and control any apparatus he proposes to operate;

(c) If required, submit himself to such examination as an authorised officer directs, the fee for such examination being five shillings; and

(d) Where the application is for a licence to transmit (and in such other cases as an authorised officer decides), be capable of operating at a speed of twelve words (Morse) per minute, sending and receiving, or undertake to have always in attendance when the station is being operated a person who is so capable.

(4) If an applicant is under 21 years of age, the application shall be countersigned by a parent, guardian, or other approved person, who shall be responsible for the observance of the conditions of the licence.

(5) Conditions with regard to wavelengths, power, location of station, and other technical features as are necessary for the protection and

safe working of other stations shall be determined by an authorised officer, and shall not be inconsistent with these regulations.

(6) All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed, and used as not either directly or by reason of the working or user thereof to interfere with the efficient and convenient working of other stations.

(7) An authorised officer may authorise the licensee in writing to operate his licensed installation at an address other than that shown in the licence.

(8) Licensed installations shall be worked solely for the purpose of conducting experiments in wireless telegraphy or telephony for the advancement of science.

(9) Licensed installations shall not be used by licensees or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages relating to the experiment in hand as authorised by the licence.

(10) Communication with licensed experimental stations only is permitted.

(11) Licensed installations shall be so worked as not to interfere with the working of any wireless telegraph or telephone station established in Australia by or for the purposes of the Minister or any department of the Commonwealth of Australia, or for commercial purposes, and in particular with the transmission or receipt of any messages between or at such wireless telegraph or telephone stations on land and wireless telegraph or telephone stations established on ships at sea. On no account shall His Majesty's ships be called by means of the licensed installation.

(12) The licensee shall not (either by himself or by any person acting on his behalf or by his permission), by the transmission of any message by means of the licensed installation or otherwise by the use of the licensed installation interfere with naval or military signalling.

(13) The provisions of the last preceding sub-regulation shall be construed to be without prejudice to the generality of any other provisions of these regulations.

(14) An authorised officer may grant a temporary permit for a demonstration of wireless telegraphy or telephony in connection with lectures, entertainments, or any such proceeding calculated to assist the development or public appreciation of the art.

(15) It shall be a condition of the licence that the licensee shall not purchase or otherwise obtain any wireless apparatus for any purpose other than for the conduct of experiments as authorised by the licence.

10. (1) A portable station licence shall be granted only in special cases within the discretion of the Minister or an authorised officer.

(2) In no case will it be permissible to transact, by means of the station, business which constitutes competition with the Postmaster-General's telegraph or telephone services, or commercial wireless services.

(3) The licensee shall be a holder of an operator's certificate of proficiency; or the station shall be operated by a person certified by an authorised officer as being competent to operate the station efficiently.

(4) The applicant shall state the station or stations he desires to communicate with, and communication with no other station or stations will be permitted except in cases of distress.

11. (1) An aircraft station licence shall be issued in respect of a station installed on aircraft for purposes of communication with other authorised stations.

(2) The station shall be operated by a competent person authorised by an authorised officer.

(3) The applicant shall state the station or stations with which it is desired to communicate normally.

12. (1) A licence other than a broadcasting station licence shall be for a period of one year from the date thereof, and may be renewed from time to time, the renewal date being the first day of the month in the year of renewal corresponding to the month in which the licence was granted.

(2) A broadcasting station licence shall be for such periods and shall be renewable as provided in Part IV of these Regulations.

13. (1) The following fees shall be payable for each year or portion of a year during which any licence is in force:—

- (a) For a coast station licence, one pound;
- (b) For a ship station licence—one pound;
- (c) For a land station licence—one pound;
- (d) For a broadcasting station licence—fifteen pounds.

(e) For a broadcasting (receiving) station licence—the fee provided in Division II of part IV of these Regulations.

(f) For a dealer's licence—one pound;

(g) For an experimental licence (transmitting and receiving)—one pound;

(h) For an experimental licence (receiving only)—ten shillings.

(i) For a portable station licence—one pound.

(j) For an aircraft station licence—one pound.

Provided that the Minister may grant any licence free of charge to Amalgamated Wireless (Australasia), Limited, pursuant to the agreement made on 28th March, 1922, between the Commonwealth and Amalgamated Wireless (Australasia), Limited.

(2) The fees under this regulation shall be paid in advance.

(3) If a transmitting licence is issued to the holder of a receiving licence, an additional fee at the rate of 2s. 6d. per quarter or portion thereof shall be charged during the currency of the receiving licence.

14. (1) Before any licence is granted, the applicant shall satisfy the Minister or an authorised officer that the wireless telegraphy apparatus, or appliances to be worked in pursuance of the licence comply with the regulations for the time being in force governing syntony and wavelength.

(2) The transmitting apparatus used on the licensed stations shall be of such a character that the waves emitted are as pure and little damped as possible, and the receiving apparatus used at licensed stations shall be of such a character as to afford the greatest possible protection from disturbance during reception of signals.

15. Notwithstanding anything contained in any experimental licence granted prior to the making of these Regulations, neither the holder of any licence other than a broadcasting (receiving) licence nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent equal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person by virtue of the licence. See also Regulation 4 (3).

16. (1) Every licence (except a ship licence or broadcasting (receiving) licence) shall be made out in duplicate.

(2) A ship licence shall be in three parts, two parts shall be issued to the licensee and the other retained in the department.

(3) One part of the licence shall be exhibited in the room where the licensed apparatus is installed. In the case of a portable station or an aircraft station, a card in accordance with the form in the schedule shall be carried.

17. (1) A licence may be renewed by the issue of a fresh licence or by writing thereon or attaching thereto a memorandum stating the period for which it is renewed signed by the Minister or an authorised officer.

(2) The memorandum shall be written on each part of the licence, but in the case of the licensee's part, it shall be in the form of an official receipt for the renewal fee signed by the Minister or an authorised officer or by any person authorised to receive moneys on behalf of the department.

(3) The receipts shall be attached by the licensee to the part or parts of the licence in his possession.

18. (1) The Minister may, by notice in writing revoke and determine any licence, on the ground of the licensee having failed to comply with any regulation for the time being in force under the Act or with any condition of the licence or any other ground specified in the licence.

(2) The licensee shall not be entitled to any compensation by reason of any such revocation or determination.

19. Licences issued by the Prime Minister or the Minister for the Navy and in force at the date of the commencement of these Regulations shall continue as if issued in pursuance of these Regulations.

PART III.—APPLICATIONS FOR LICENCES.

20. An application for a coast station licence shall be in writing and contain the following particulars:—

- (a) Name of station.
- (b) Latitude and longitude.
- (c) Source of power and maximum power taken by transmitter.
- (d) Normal range in nautical miles; (a) by day, (b) by night.
- (e) System of Wireless Telegraphy to be used, with characteristics of the system of emission.
- (f) Type of aerial.
- (g) Wavelengths (in metres) of transmitter
- (h) Nature of services performed.
- (i) Hours of service; and
- (j) Coast station charge.

21. An application for a ship station licence shall be in writing and contain the following particulars:—

- (a) The name of the ship in respect of which the licence is applied for.
- (b) The port in Australia at which the ship is registered.
- (c) Route or service in which engaged.
- (d) Number of normal crew carried.
- (e) Number of passengers as per passenger certificate.
- (f) Number of operators and watchers.
- (g) Hours of service.
- (h) Gross tonnage.
- (i) The system of wireless telegraphy to be used on the ship.
- (j) Normal range of signalling in nautical miles; (a) by day, (b) by night.
- (k) Description of transmitting apparatus including spark frequency and type of discharger.
- (l) Description of receiving apparatus.
- (m) Wavelengths (in metres) of transmitter.
- (n) Source of and maximum power.

(o) Maximum power taken by transmitting apparatus in amperes and volts.

(p) If alternator is used, number of cycles per second.

(q) Particulars of emergency apparatus showing primary power in volts and amperes and source of energy (capacity of storage battery to be stated if employed); and

(r) Ship station charge.

22. An application for a land station licence shall be in writing and contain the following particulars:—

(a) The locality of the station, in respect of which the licence is applied for.

(b) The name of the owner of the property on which the station is situated and whether the applicant is owner or lessee.

(c) A description of the system of wireless telegraphy to be used (transmitter and receiver), including source of power and maximum power taken by transmitter.

(d) Type of aerial.

(e) Wavelengths (in metres) of transmitter.

(f) Source of and maximum power.

(g) Maximum power taken by transmitter.

(h) Name of station or stations with which it is desired to communicate.

(i) Normal range of signalling. (in miles);

(a) by day, (b) by night, and

(j) Charges for service.

23. An application for a broadcasting station licence shall be made as provided in Regulation 29 of these Regulations.

24. An application for an experimental licence shall be in writing and set out the following particulars:—

(a) Name in full, age, address, technical training or qualifications, present occupation, nationality and the parents' nationality.

(b) If the applicant is under 21 years of age the application shall be countersigned by a parent, guardian, or other approved person

(c) The scientific, technical, practical or other grounds upon which it is desired to obtain a licence.

(d) Complete diagram of connections and description of the apparatus it is intended to use and

(e) A statutory declaration regarding the secrecy of wireless communications.

25. An application for a portable station licence shall be in writing and shall set out the following particulars:—

(a) Name and address of applicant.

(b) The purposes for which the proposed station is to be utilised.

(c) The area within which it is proposed to transport and operate the station.

(d) The station or stations with which it is desired to communicate.

(e) Complete description (with diagram of connections) of the apparatus to be utilised in the proposed station; and

(f) A statutory declaration regarding the secrecy of wireless communications.

26. An application for an aircraft station licence shall be in writing, and shall set out the following particulars:—

(a) Name and address of applicant.

(b) Nature of service on which aircraft is engaged.

(c) Description of system of wireless telegraphy to be utilised.

(d) Normal range of signalling in miles—

(a) by day, (b) by night.

(e) Wavelength of transmitter.

(f) Source of power and maximum power taken by transmitter.

(g) Station with which it is desired to communicate; and

(h) A statutory declaration regarding the secrecy of wireless communication.

27. Before granting any licence the Minister or an authorised officer may require the applicant to furnish such additional particulars as he thinks necessary.

PART IV—BROADCASTING.

DIVISION 1, BROADCASTING STATIONS.

28. Except where any inconsistency exists nothing in this part shall affect the generality of the provisions of the other parts of these regulations.

29. An application for a broadcasting station licence shall be in writing, and shall contain the following particulars:—

(a) Name and address of applicant.

(b) Technical qualifications of applicant or the persons who it is proposed will operate the licensed installation. (Where the applicant does not possess the necessary qualifications and proposes to engage an expert to control the station after the issue of the licence, this should be stated).

(c) Registered title of the company on behalf of which application is made, or, in the case of an application from a private individual particulars of financial stability.

(d) Location of proposed station.

(e) Type of transmitter and character of modulation proposed.

(f) Maximum power of transmitter (in high frequency generator circuit).

(g) Type of aerial and natural wavelength.

(h) Wavelength desired for broadcasting.

(i) Hours of service.

(j) Class of service to be broadcasted and

(k) Circuit diagram of transmitter and receiver.

30. (1) A broadcasting station licence in accordance with Form 4 in the schedule to these Regulations may be granted in respect of a station operated for the purpose of transmitting to broadcasting (receiving) licensees.

(2) The licence shall be prepared in duplicate, one copy to be retained by the department and the other to be issued to the licensee and to be available for inspection by authorised officers.

(3) The licence shall not be transferable, nor the location of a licensed station changed without the approval of the Minister.

31. (1) A broadcasting station licence shall continue in force for a period of five years from the date of granting, and shall be renewable annually thereafter.

(2) The fee payable for such a licence shall be fifteen pounds per annum payable in advance.

32. (1) A broadcasting station licence may be granted only to an applicant who produces evidence to the satisfaction of the Minister of financial and technical capability to provide and maintain a reliable broadcasting service.

(2) A licensee shall, within one month after the issue of the licence, give an undertaking, supported by a financial guarantee of one thousand pounds approved by the Minister, to commence the broadcasting service within six months, or such extended time not exceeding six months, as the Minister may decide, after the date of the issue of the licence, and to maintain the service to the satisfaction of the Minister for a period of five years.

(3) If the licence be renewed at the termination of that period, a similar undertaking and a similar guarantee shall be required in respect of the period covered by the renewal.

33. (1) The broadcasting station shall be operated at the power and wavelength shown in the licence, subject to such alterations as the Minister directs, or the Minister or an authorised officer permits.

(2) The power shall be rated in watts, measured in the high-frequency generator circuit of the transmitting apparatus.

(3) The licensee may apply for the use of any power between 500 and 5,000 watts, which shall be fixed at the Minister's discretion.

(4) The power rating and the circuit arrangements indicated in the licence shall not be altered without the permission of the Minister or an authorised officer.

34. (1) The transmitting apparatus shall be equipped with a tuned circuit coupled to the aerial, and shall be so designed as to maintain reasonably constant radiation during periods of operation, and shall be as free as possible from injurious harmonics.

(2) It shall be controlled in such a manner as to minimise the risk of interference with other stations.

(3) A maximum variation of one per centum above or below the licensed wavelength shall be permitted.

(4) Provision shall be made at the station for a wavelength indicating instrument or the equivalent to be available.

35. (1) Each licence shall be issued for the use of a particular wavelength selected from bands available for broadcasting between 250 and 3,500 metres.

(2) The Minister shall determine the wavelength to be used, and the wavelength shall not be altered except by the direction of the Minister, or except with the permission of the Minister or an authorised officer.

(3) The Minister shall determine the number of wavelengths to be used at any centre.

(4) When the number of approved applications exceeds the number of approved wavelengths available for a particular centre, the matter shall be determined by ballot at the discretion of the Minister as between the parties affected.

36. The Minister reserves the right to curtail the hours of broadcasting at any time if found advisable in the public interest.

37. (1) The licensee shall include in the programme to be broadcasted such items of general interest, and shall broadcast them in such manner as the Minister stipulates from time to time.

(2) The volume of stipulated items shall not be such as to entail a period of occupation of the broadcasting station in excess of thirty minutes in each consecutive period of twelve hours.

(3) All matter broadcasted shall be subject to such censorship as the Minister determines.

38. The licensed installation shall be operated by a certificated operator who shall sign a declaration of secrecy of wireless communications.

39. The licensed installation shall include receiving apparatus of a type which will not cause the aerial to oscillate.

40. Re-broadcasting shall only be permitted with the consent of the licensee of the original broadcasting station, and then only on such conditions as are determined by the Minister or an authorised officer.

41. The licensed installation shall be open at all reasonable times to inspection by authorised officers, and every reasonable facility shall be given for ascertaining the condition of the station, and whether these Regulations are being complied with.

42. (1) The broadcasting station shall be connected by telephone with the public telephone exchange system, the centre in which the broadcasting station is located.

(2) The broadcasting station licensee shall enter into the usual telephone subscribers agreement for the establishment of the service.

43. Any licensee of a broadcasting station who is authorised to issue broadcasting receiving licenses, shall execute the provisions of these Regulations relating thereto.

DIVISION II.

BROADCASTING (RECEIVING) STATIONS.

44. (1) A broadcasting (receiving) licence in accordance with Form 5 in the Schedule to these Regulations may be issued to any person on payment of the annual licence fee of 10s., together with the annual subscription payable to the broadcasting station licensee.

(2) Broadcasting (receiving) licences shall be prepared in triplicate, and shall be numbered consecutively.

(3) The department may supply books of forms to broadcasting station licensees, who shall be responsible for the issue of the licences and collection of the licence fees and any amount payable in respect of the issue of the licences shall be recoverable from the broadcasting station licensee as a debt due to the Crown.

(4) A broadcasting station licensee or any agent or employee of the licensee shall issue the original copies of the licences to the licensees retaining the triplicate copies, and once a month forward the duplicate copies, together with the licence fees, to the department.

45. (1) The broadcasting (receiving) licence will be issued for one year, and shall be renewable on payment of the annual licence fee from the first day of the month in the year of renewal corresponding to the month in which the licence was issued.

(2) The licence shall not be transferable.

(3) A broadcasting (receiving) licensee shall not transfer or otherwise dispose of the licensed installation to any person other than to a person holding a broadcast (receiving) licence.

46. (1) The receiving apparatus which may be purchased or hired for use by a broadcasting (receiving) licensee shall be of a type approved by the Minister or by an authorised officer. It shall bear a stamped indication of such approval in the following form:—

BROADCASTING RECEIVER
Approved by P.M.G.
Type No.....
..... metres.

(2) Approved broadcasting receivers shall be so constructed as to respond to the wavelength indicated on the stamped indication, or to any wavelength not differing more than 10 per centum from that specified. The receivers shall not respond to wavelengths outside the specified limits.

(3) No receiving apparatus shall contain a valve or valves so connected as to be capable of causing the aerial to oscillate.

(4) For the purpose of approving any type of receiving apparatus the Minister or authorised officer shall not have regard to the method of construction of the apparatus, but shall have regard only to reaction and the wavelength to which the receiver will respond without alteration.

(5) All apparatus bearing the stamp referred to in sub-Regulation (1) of Regulation 46 of these Regulations shall bear a seal approved by the Minister.

(6) No person, except an authorised officer, the maker, or an accredited agent, shall break or interfere with the seal. He shall re-affix it before returning the apparatus to the control of the licensee.

47. (1) Tests of sets may be made by authorised officers for the production of oscillations in the aerial and for interference properties with a factor of safety, *i.e.*, increasing the anode battery by about 30 per centum, changing valves or other essential parts of the apparatus but not by altering any soldered connections.

(2) After approval of a type set the type shall be given a registered number, and makers, accredited agents or users (in case of sets made by the users), shall see that all sets comply with the approved type before they are sold or used.

(3) The unit or set approved as a pattern instrument for an approved type shall be retained by the maker or accredited agent without alteration.

(4) No change in the design or circuit arrangements affecting wavelength and reaction characteristics of an approved type shall be made without the previous sanction of an authorised officer.

48. The approval of the Minister or an authorised officer does not carry any implied guarantee of quality, workmanship, or sensitivity of the apparatus, and shall not render the Minister or any authorised officer liable or responsible for any infringement of a patent for an invention by any licensee, or by any maker, vendor, purchaser or user of the apparatus.

49. All sets other than those assembled by their users shall bear the stamped indication referred to in Regulation 46 of these Regulations, together with the type, number and wavelength.

50. (1) An authorised officer shall have the right at any time to select any apparatus available for disposal or actually disposed of to a broadcasting (receiving) licensee to determine whether it be in conformity with the approved type.

(2) In the case of sets which, as the result of tests, are found not to comply with the provisions of Regulation 46 of these Regulations, the authorisation of the future sale or hire of that class of set may be cancelled by the authorised officer; and any other similarly defective sets, which have been disposed of to licensees shall be modified at the vendor's expense to conform with these Regulations.

(3) The vendor may appeal to the Minister, who may affirm or revoke the cancellation.

(4) Similar sets hired out shall be withdrawn from service, until they are altered so as to conform with these Regulations.

51. No standard aerial is prescribed, but tests, made by the officers of the department to determine conformity with Regulation 46 of these Regulations, shall be made on an elevated aerial 100 feet long.

52. (1) Licensees who propose assembling or who have assembled parts into receiving sets shall arrange their receivers in conformity with requirements of Regulation 46 of these Regulations to the satisfaction of the Minister or an authorised officer.

(2) The tuning elements of the receivers shall be assembled and enclosed in a box or case suitable for effective sealing.

(3) The box or case containing the tuning elements shall be submitted to an authorised

officer, who will ascertain by test whether Regulation 46 of these Regulations is complied with.

(4) A charge of 2s. 6d., payable in advance, shall be made for each test.

(5) If the set complies with Regulation 46 of these Regulations the box or case containing the tuning element shall then be sealed and returned to the licensee, together with a certificate of such compliance.

(6) A copy of the certificate shall be forwarded by the authorised officer to the broadcasting station licensee concerned.

53. (1) A licensee who desires to receive at the same address from more than one broadcasting station may have separate receivers, or may have his receiver altered so as to respond to the wavelength of the other station or stations.

(2) The alterations to the receiving apparatus shall be made in conformity with the requirements of Regulation 46 of these Regulations.

(3) In case of any such multi-wavelength reception the subscription to all the broadcasting stations concerned shall be paid to the respective broadcasting station licensees, and the broadcasting receiving licence fee shall be £1 per annum, provided that the installations so licensed are operated by the same address.

54. (1) Where a broadcasting (receiving) licensee desires to remove the licensed installation to a new address which is not at a greater distance than twenty miles radially from the original address, permission shall be obtained from the broadcasting station licensee concerned for the operation of the licensed installation at the new address.

(2) The broadcasting station licensee shall notify the Department monthly of all changes of address so authorised.

(3) A temporary removal shall be dealt with in the manner indicated in sub-Regulation (1) of this Regulation, but notification to the Department of the change of address is not required unless the period to be covered exceeds three months.

(4) Removal of a licensed installation to any address at a distance greater than 20 miles radially shall not be made without the consent of the Minister or an authorised officer.

55. All licensees shall permit authorised officers or approved employee of the broadcasting station licensee whose programmes they receive, thereto authorised by him, to inspect, at any reasonable time in the daytime, licensed installations and shall provide all reasonable means for such inspections.

56. A broadcasting (receiving) licensee shall not operate his licensed installation, or permit it to be operated, for profit, without the consent of the broadcasting station licensee.

DIVISION 3.—SALE OF BROADCASTING (RECEIVING APPARATUS.

57. (1) The Minister may grant a dealer's licence in accordance with Form 6 in the schedule to these Regulations permitting any person, firm, or company, to sell or let on hire or otherwise dispose of complete broadcasting receivers or parts comprising the complete tuning element of those receivers.

(2) A licence shall be granted in respect of a particular address of the licensee and shall not be exercised in respect of any other address without the consent of the Minister or an authorised officer.

(3) A licence is not transferable.

(4) The licensee shall exhibit a notice on his premises as follows: "Licensed Radio Dealer,"

58. The fee for the granting or renewal of a licence referred to in the last preceding Regulation shall be one pound payable in advance.

59. No person, firm, or company, shall sell or let on hire or otherwise dispose of any apparatus referred to in Regulation 57 of these Regulations to any person, unless he or it is satisfied that he holds a broadcasting (receiving) licence or an experimental licence.

60. Any person, firm or company, who deals in the apparatus referred to in Regulation 57 of these Regulations, shall keep a record of the sales, hirings and disposals of that apparatus and shall permit any employee of a broadcasting station licensee thereto authorised in writing by the licensee to inspect the record at any reasonable time.

PART V.—WORKING OF STATIONS

61. The provisions of the Radiotelegraphic Convention and the Service Regulations for the time being in force thereunder, so far as such convention and Regulations are applicable, shall apply to all wireless telegraphy installations available for the transmission or receipt of messages or wireless communications, whether installed by the commonwealth or under licence and to all messages handled by those installations and every licensee shall comply therewith.

62. (1) In cases of ship stations, there shall be a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this regulation as to emergency installations as well as those to normal installations, a normal installation alone will suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least one hundred nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy, capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of eighty nautical miles for ships of class I as defined in Navigation (Wireless Telegraphy) Regulations 1921 (being Statutory Rules 1921, No. 104, as amended from time to time), and fifty nautical miles for ships of classes II and III as so defined, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power from the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of the last preceding sub-Regulation as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a coast station when employing a receiver without amplification devices.

63. When communications are made by means of wireless telegraphy between a ship (whether Australian, British or Foreign) in territorial waters and a coast station, the rules in force for the working of wireless telegraphy at the coast station shall be observed.

64. (1) The waves emitted by any station licensed in Australia must be as little damped as possible and in no case shall the logarithmic decrement of a complete oscillation exceed two-tenths except when sending distress signals or messages relating thereto,

(2) The coupling between the primary and secondary of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent between the mean wavelength and either of the two waves emitted by the coupled circuits.

65. All vessels licensed under the Act which are fitted with wireless telegraphy installations, and which trade in the territorial waters of the Commonwealth or adjacent Islands under Commonwealth control shall be equipped with tuned crystallite receivers or receivers of the thermionic valve type of such a character as to afford the greatest protection from interference during the reception of signals.

66. A reasonable number of such spare parts of both the main and emergency apparatus as are subject to undue wear or deterioration and one extra pair of head telephones, extra cords, extra detectors, battery testing instruments, and distilled water shall always be available in ship stations.

67. Power for the operation of the main equipment shall be available on all vessels licensed in Australia during the periods of watches maintained in accordance with Schedule I of the licence or the Navigation (Wireless Telegraphy) Regulations (being Statutory Rules 1921, No. 104, as amended from time to time).

68. (1) The master of a vessel shall have the right to censor all messages addressed to or transmitted by a station on board the vessel under his control, but the master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of the censorship, nor shall the master nor any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge, and not intended for the said station.

(2) Any master or person employed on a ship having access to wireless messages shall make a Statutory declaration regarding the secrecy of wireless communications.

69. (1) The wireless telegraphy appliances on board any ship (whether Australian, British or Foreign) in the territorial waters or in any station shall be worked in such a way as not to interrupt or interfere with; (a) naval or military signalling; or (b) the transmission of messages between wireless telegraph stations.

(2) In this regulation "naval or military signalling" includes signalling or communicating by means of any system of wireless telegraphy by the King's Imperial or Dominion Naval or Military forces.

(3) Prompt compliance with any instructions or standard code signal transmitted by Commercial or Defence stations indicating that all experimental transmitting stations must cease operating for a stated period shall be given by all licensees of experimental or portable stations.

70. (1) The transmission of superfluous signals by any station is absolutely prohibited; trials and practices are forbidden, except under such circumstances as to preclude the possibility of interference with other stations.

(2) No person shall transmit or make a signal containing profane words or language or transmit improperly the call sign of another station or any signals not necessary for the conduct of experiments or traffic.

71. Except by permission of the Minister or persons authorised by him the wireless telegraphy appliances on board any Australian ship, British ship, or foreign ship (other than a ship of war) shall not be worked or used while the ship is moored to any wharf or pier in Australia.

Provided that any ship anchored or moored in accordance with the provisions of the "Quarantine Act," 1908-1920, or any regulations thereunder may use wireless apparatus for the purpose of communication with a coast station when no alternative method of electrical communication is available.

72. The Minister or any person authorised in writing by the Minister or the Controller may, at all reasonable times, enter upon any station on which wireless telegraphy appliances are installed, or are in course of being installed in pursuance of a licence; and may examine or test the appliances and the working and user thereof. See also Regulation 87.

PART VI.—CONTROL OF COMMUNICATIONS AND APPLIANCES IN EMERGENCIES.

73. (1) In cases of emergency, of which the Minister shall be the sole judge, the Minister or any authorised officer or the Naval Board or any officer in command of any ship of war of His Majesty's Navy (whether Imperial or Dominion), or any officer in command of any part of the Defence Force, may—

(a) Take possession of any wireless telegraph appliances installed on any station in pursuance of a licence, and use such appliances for the King's service; or

(b) Place any person in control of any such appliances; or

(c) Direct the licensee or person in charge of the appliances to submit to him all or any of the messages tendered for transmission or receive by means of the appliances; or

(d) Stop or delay or direct the licensee or person in charge of the appliances to stop or delay the transmission or delivery of any such messages or to deliver them to him; or

(e) Direct the licensee or person in charge of the appliances to comply with all such directions as he thinks fit to give with reference to the transmission or receipt of messages by means of the appliances.

(2) Every licensee and every person in charge of any wireless telegraphy appliances installed in pursuance of a licence shall comply with this Regulation and all directions issued in pursuance thereof.

(3) Reasonable compensation shall be payable to the licensee for any damage to the appliances arising in consequence of the exercise of the powers conferred by this Regulation.

(4) The Minister may, notwithstanding anything contained in a licence, issue to a licensee under these Regulations by order published in the *Gazette* prohibit for such time as he directs any licensee from communicating with any station licensed by or belonging to or in any country which is at war with His Majesty the King or the possessions thereof.

(5) Any order under paragraph (e) of sub-Regulation (1) of this Regulation may prohibit all communications whatever, or may prohibit communications to particular stations or under special circumstances.

74. (1) The use of wireless telegraphy appliances on board any foreign ship of war while in any harbour in Australia shall be subject to such rules (whether prohibitive or regulative) as the Governor-General thinks fit to make.

(2) If at any time an emergency has arisen in which it is expedient that the Commonwealth Government should have control over the transmission of all messages by wireless telegraphy, the Governor-General may, by notice in the *Gazette*, prohibit for such period as he thinks necessary the use of wireless telegraphy on board foreign ships in territorial waters.

PART VII.—PROFICIENCY CERTIFICATES FOR OPERATORS AND WATCHERS.

75. Every ship station and coast station in respect of which a licence is issued shall be operated by a person or persons holding a certificate of proficiency in accordance with the form in the schedule or certificates of proficiency issued after examination by the Minister or person authorised in that behalf by the Minister or by the Postmaster-General of the United Kingdom, or by the proper authority in any part of the British Empire.

76. Certificates of proficiency shall be issued to candidates over 18 years of age who have passed an examination which shall include the requirements of Article 10 of the Service Regulations appended to the International Radiotelegraphic Convention, and the "Handbook for Wireless Telegraph Operators" issued by the Postmaster-General of the United Kingdom.

77. The certificate shall be of two classes, namely:—

(a) First class indicating a satisfactory knowledge with regard to

(1) The adjustment of the apparatus and the working thereof.

(2) Transmitting and receiving by sound at a speed which must not be less than 20 words per minute (five letters being counted as one word); and

(3) The regulations applying to the exchange of radiotelegraphy communications; and

(b) Second class, indicating a satisfactory knowledge with regard to

(1) The adjustment of the apparatus and the working thereof;

(2) Transmitting and receiving by sound at a speed of 12 to 19 words per minute (five letters being counted as one word); and

(3) The regulations applying to the exchange of radiotelegraphy communications.

78. (1) A fee of 10s. shall be paid by the candidate on each occasion on which the candidate is examined.

(2) A certificate of proficiency may be issued at a charge of 5s. to each candidate who satisfactorily passes the prescribed examination, and in the event of a certificate being lost a fee of 10s. shall be paid for the first copy of the certificate, £1 for the second copy, and £2 for any subsequent copy.

Provided that the Minister may authorise the issue of a duplicate or copy of a certificate without charge where it is shown that the original certificate has been lost or destroyed in circumstances over which the holder has no control.

79. In case of failure, a candidate shall not ordinarily be re-examined in any system until the lapse of three months.

80. If a person to whom a certificate of proficiency has been issued by the Minister

(a) Is convicted of a criminal offence; or

(b) Is, on account of incompetence, or for any other reason, considered by the Minister to be unsuitable to continue to hold the certificate, the Minister may withdraw, cancel or suspend the certificate.

81. Certificates of proficiency issued by the Prime Minister or the Minister for the Navy and in force at the date of the commencement of these Regulations, shall continue in force as if issued in pursuance of these Regulations.

82. The certificate of proficiency held by each operator shall be exhibited in the operating room in respect of stations at which he is serving or shall be readily available for inspection by authorised officers.

83. (1) Every person acting as a Wireless telegraphy watcher in accordance with the provisions of Section 231 of the "Navigation Act," 1912-1920, shall hold a certificate of proficiency as a watcher in accordance with the form in the schedule issued by the Minister or person authorised in that behalf by the Minister, or by the Postmaster-General of the United Kingdom or by the proper authority in any part of the British Empire, certifying that the holder is capable of receiving and understanding the radiotelegraph distress signal and the alarm signal, and has sufficient knowledge of the apparatus on which he will be required to keep watch to known by means of a buzzer or other similar test that it is in proper condition to receive signals.

(2) A certificate of proficiency as a watcher shall not be issued to any person under 16 years of age.

(3) A fee of 5s. shall be paid by the candidate on each occasion on which he is examined.

84. (1) Except with the consent of the Defence Authorities a certificate of proficiency in accordance with Form 11 or 12 in the Schedule to these Regulations shall not be granted to any person who is not a natural-born British subject, or whose father was not a natural-born British subject at the date of that person's birth, or whose mother was at any time a subject of a state with which His Majesty was at war during the war which commenced on the fourth day of August, One thousand nine hundred and fourteen.

(2) In case of emergency a special certificate may be granted to watchers of other than British nationality for one voyage only.

PART VIII.—MISCELLANEOUS

85. Nothing in these Regulations shall be construed as rendering the Minister liable or responsible for any infringement by licence in the exercise of his licence of copyright in any work or of any patent for an invention, or for any breach of the law arising out of the exercise of the licence, and nothing in these Regulations shall affect the liability of the licence in respect of any such act done by him.

86. These Regulations shall not prevent the use, without licence, by the Defence Authorities of wireless telegraphy for Defence purposes:

Provided that each wireless telegraphy installation (other than a mere temporary installation) to be used shall be authorised in writing by the Minister.

87. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraphy station has been established or that an apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or officer appointed in that behalf by the Minister or authorised officer and named in the warrant, and the warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship,

and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

88. (1) In this Regulation "detained appliances" means an appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy which was taken into possession or controlled by or on behalf of the Commonwealth during the existence of the state of war which commenced on the fourth day of August, one thousand nine hundred and fourteen.

(2) Any detailed appliance may be returned to a person who satisfies the Minister or any officer authorised by the Minister that he is entitled to delivery of the appliance.

(3) Notification may be given in the *Gazette* or by registered post to the person from whom the detained appliance was received requiring him to attend at the place where the appliance is stored and to take delivery thereof within a time fixed by the notification.

(4) If a person entitled to delivery fails to remove the appliance within the time specified in the Notice, or if the Minister or the officer authorised by the Minister is satisfied that any person so attending is not entitled to delivery thereof the appliance may be sold either by public auction or private contract at the owner's risk.

(5) The net proceeds of the sale after deduction of all expenses of sales may be paid to any person who satisfies the Minister that he is entitled to the net proceeds.

89. Any person who acts in contravention of any provision of these Regulations or fails to comply with any condition of a licence, shall be guilty of an offence against these Regulations.

Penalty fifty pounds.

90. (1) The Wireless Telegraphy Regulations 1922 (being Statutory Rules 1922, No. 169), and the Telegraph (detained appliances) Regulations (being Statutory Rules 1921, No. 190), are hereby repealed.

(2) Notwithstanding the repeal of the Wireless Telegraphy Regulations 1922, the rates in force by virtue of those Regulations immediately prior to the repeal shall, subject to any alteration made in pursuance of the agreement made on the 28th of March, 1922, between the Commonwealth of Australia and Amalgamated Wireless (Australasia), Ltd. be the rates to be charged for messages transmitted or received by wireless telegraphy within the Commonwealth or between the Commonwealth and any territory under the authority of the Commonwealth or between any such territories.

THE SCHEDULE.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

"WIRELESS TELEGRAPH ACT" 1905-1919
COAST STATION LICENCE.

C In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to M to erect a wireless coast station at and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations as amended

from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.

Chief Manager, Telegraphs and Wireless.
Date

SCHEDULE OF THE AUTHORISED STATION.

1. No. of licence.
2. Name of station.
3. Latitude and longitude.
4. Call Sign.
5. Source of power and maximum power taken by transmitter.
6. Normal range in nautical miles; (a) by day, (b) by night.
7. System of radio telegraphy with the characteristics of the system of emission.
8. Type of aerial.
9. Wavelength in metres (the normal wavelength is underlined).
10. Nature of services performed.
11. Hours of service.
12. Charge per word for traffic.

Signature of licensee.

Date

COMMONWEALTH OF AUSTRALIA.

"WIRELESS TELEGRAPHY ACT" 1905-1919.
Form 2.

D SHIP STATION LICENCE.

Dated 19

To all to whom these Presents shall come I the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919, send greeting.

Whereas, of in the State of (hereinafter called the licensee) is desirous of establishing, erecting, maintaining, and using on the called belonging to the licensee appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy;

And whereas by reason of the provisions of the Telegraph Acts, 1863 to 1907, of the United Kingdom, and the Wireless Telegraphy Order, 1908, of the United Kingdom, it is unlawful to establish any wireless telegraph station of install or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas), except under and in accordance with a licence granted in that behalf by the Postmaster-General of that Kingdom:

Provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to permit an offence against the Wireless Telegraphy Act, 1904, of the United Kingdom by reason of the installation and working of wireless telegraphy in such ship if the authority in such possession or protectorate, having power by law so to do, shall have granted a licence for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such licence:

And whereas the ship in respect of which this licence is granted is registered in the Commonwealth:

And whereas by the Wireless Telegraphy Act, 1905-1919, of the Commonwealth of Australia, it is enacted that licences to establish, erect, maintain, and use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being administering the Act for such terms and on such conditions and on payment of such fees as are prescribed:

And whereas the licensee has made application for this licence and has paid the prescribed fee payable in respect thereof:

Now I

The Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act, 1905-1919, aforesaid in pursuance of the Wireless Telegraphy Act, 1905-1919, and in exercise of all powers and authorities enabling me in this behalf to hereby grant to the licensee during the term or period commencing on the day of 19, and terminating on the day of 19, licence and permission—

(1) To establish, erect and install and maintain, work and use for the purposes hereinafter mentioned at the ship station specified in the first schedule hereto appliances or apparatus for wireless telegraphy of the kind used in the system known as the system of wireless telegraphy (which apparatus is hereinafter referred to as "the licensed installation") provided that

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, as is specified in the said schedule opposite to the name of such station;

(b) The installation installed shall be of the character specified in the said First Schedule;

(c) A complete scheme of the connections intended to be employed shall be supplied by the licensee;

(d) The transmitting installation used on the ship station shall be of such a character that the waves emitted are as pure and little damped as possible and the receiving apparatus used at the said station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(e) The licensed installation shall be so constructed as to be capable of using wavelengths of 300 and 600 metres in length as measured by the standard of measurement in use at the Post Office in the United Kingdom for the time being, and may have such other wavelengths as shall be authorised in writing from time to time by the Minister or any authorised officer;

(f) The speed of transmission and reception of messages shall not, in normal circumstances, be less than 20 words per minute, five letters being counted as one word.

(2) To transmit and receive messages by means of the licensed installation between the said ship station and coast stations and other ship stations: Provided that the transmission and receipt of messages from and at the said ship station when in any harbour in the British Islands shall be subject to such conditions and restrictions as the Postmaster-General of the United Kingdom may prescribe from time to time, and when in any harbour in the Commonwealth or any territory under the control of the Commonwealth, shall be subject to the Regulations under the Wireless Telegraphy Act, 1905-1919; and

(3) To receive money or other valuable consideration for or in respect of the use of the

licensed installation, or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the First Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1905-1919.

The term "telegraph" has the same meaning as in the Telegraph Act, 1869, of the United Kingdom.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's navy, between ships of His Majesty's Navy or a naval station, and any other wireless telegraph station, whether a coast station or a ship station.

The expression "His Majesty's Navy" includes ships, being part of the naval forces of any part of His Majesty's Dominions.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions "the International Telegraph Convention" and the "International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th to 22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraphic Convention," 1912, means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a station which is established on land or on board a ship permanently moored, and which is open for the transmission and receipt of messages by means of wireless telegraphy between land and ship stations or other coast stations.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

The expression "authorised officer" means any officer thereto authorised in writing by the Minister.

2. The licensed installation shall not be used by the licensee or by any other person, either on behalf or by permission of the licensee, for the transmission or receipt of messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed installation or otherwise by the use of the licensed installation interfere with naval signalling.

(2) Stations using wavelengths longer than those set apart for naval purposes shall not emit any subsidiary waves or harmonics likely to interfere with signalling or the commercial wavelengths or naval wavelengths in the vicinity.

(3) If the Minister is of opinion that the working of the licensed installation specified in

the First Schedule hereto is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister or any authorised officer so to do, close the said station.

(4) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this Licence, the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the "Wireless Telegraphy Act," 1905-1919, so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister or any authorised officer from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed installation to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed installation shall not, without the consent of the Minister or any authorised officer, be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

9. The installation shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radio Telegraphic Convention, 1912.

10. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. (1) Subject to the provisions of this licence, the licensee shall transmit and receive messages by means of the licensed installation on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise; Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of the Commonwealth, the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

12. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and re-transmit them with the least possible delay to the proper authorities by means of the licensed installation or any other means in the power of the licensee.

13. The licensed installation at the said ship station shall be worked only by a person or persons holding a certificate or certificates of proficiency issued by the Minister or by the Postmaster-General of the United Kingdom. Certificates of proficiency shall be granted only to persons who satisfy the Minister that they possess the requisite technical proficiency as

regards operating and knowledge of the Regulations governing signalling, and shall be in such form and subject to such conditions as the Minister shall from time to time prescribe.

14. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or the Government of the Commonwealth or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee by means of the licensed installation. The operator and other persons having access to the messages transmitted or received by the licensed installation shall make a declaration of the secrecy of wireless communications.

15. The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed installation, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister or any authorised officer shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention, 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the Head Office of the licensee in between the hours of 10 a.m. and 5 p.m., on every day, except Sunday or a Statute or general holiday.

16. The Minister or any authorised officer may at all reasonable times enter upon the ship station hereby licensed for the purpose of inspecting, and may inspect any installation fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station and the working and use of such installation and telegraphic instruments.

17. The licensee shall cause to be carried on the ship to which the licence relates a print or copy of the licence certified under the hand of an appropriate officer of the Minister to be a true copy, and also such documents as may be prescribed by the Minister for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention, 1912.

18. (1) The licensee shall pay to the Minister for and in respect of the licence hereby granted a fee of one pound per annum.

(2) The fee payable under this licence shall be payable before the issue of the licence, and the fee payable upon the renewal of the licence shall be payable before such renewal.

19. Except with the consent in writing of the Minister or any authorised officer, the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licence powers or authorities hereby granted.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed installation, it shall be lawful for any officer in command of any ship

of war of His Majesty's Navy to cause the licensed installation, or any part thereof, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer may seem fit, and in that event any person authorised by the said officer may enter upon any ship on which any licensed installation is installed and take possession of the said installation and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid, instead of taking possession of the licensed installation as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed installation, either wholly or partly, and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly, or the said officer may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission by him all messages tendered for transmission or arriving by the licensed installation, or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed installation arising in consequence of the exercise of the powers conferred by this clause.

21. In any of the following cases (that is to say) :—

(a) In case any sum of money which ought to be paid by the licensee to the Minister under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the covenants herein contained;

(b) In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the covenants (other than a covenant for the payment of money) or conditions herein contained, and on the part of the licensee to be observed and performed; or

(c) In case the licensee fails to comply with any regulation for the time being in force under the Wireless Telegraphy Act, 1905-1919.

then and in any such case the Minister may by notice in writing revoke and determine these presents, and the licence, powers, and authorities hereinbefore granted, and thereupon these presents and the said licence, powers, and authorities shall absolutely cease, determine, and become void but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Minister under the covenants on the part of the licensee herein contained.

22. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time to establish, extend, maintain, and work any systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit; neither shall anything herein contained prejudice or affect the right of the Minister from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or to the transmission of messages in any part of the Common-

23. Any notice, request, or consent (whether expressed to be in writing or not) to be given by the Minister under these presents may be under the hand of the Minister or any authorised officer, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter to the Secretary at his official address within the Commonwealth.

PARTICULARS OF THE LAND STATION REFERRED TO IN THIS LICENCE.

Particulars of Emergency Installation :—
Other particulars :—

E In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by section 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to
to erect a wireless land station at

1. No. of licence. Expires
2. Locality of station.
3. Name of owner and of the property on which station is situated.
4. Source of power and maximum power taken by transmitter.
5. Normal range in nautical miles—
 - (a) by day.
 - (b) by night.

6. System of radiotelegraphy with the characteristics of the system of emission.
7. Type of aerial.
8. Wavelength in metres (the normal wavelength is underlined).
9. Stations with which communication is permitted.
10. Hours of service.
11. Charges for service.

Signature of licensee,

Date

Form 4.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.
WIRELESS TELEGRAPHY ACT, 1905-1919.
BROADCAST STATION LICENCE.

F In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919 and by the Wireless Telegraphy Regulation (name) (address)

are/is hereby licensed to erect a Broadcasting Station at and to operate the said station for a period of five years from the date hereof. The installation and operation of the said station shall be carried out in accordance with the provisions of the said Regulations and such amendments and additions thereto as are made from time to time.

Signed, sealed, and delivered by the Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act, 1905-1919.

This licence is accepted by me under the conditions above set out.

Signed, sealed, and delivered by the said licensee in the presence of

SCHEDULE OF THE AUTHORISED STATION.

- | | |
|---|-------------------|
| 1. No. of licence. | Expires |
| 2. Name of licensee. | |
| 3. Location of station. | |
| 4. Type of transmitter. | Power watts. |
| 5. Type of receiver. | |
| 6. Operating wavelength. | Call sign. |
| 7. Circuit diagram of transmitter and receiver. | |

No. Form 5

COMMONWEALTH OF AUSTRALIA.

Date licence expires

POSTMASTER-GENERAL'S STATEMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.
BROADCASTING (RECEIVING) STATION LICENCE.

G In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a broadcasting (receiving) station at and to operate the said station for a period of twelve months ending

The installation and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, and any such amendments and additions thereto as are made from time to time.

The payment by the licensee is hereby acknowledged of the licence fee of ten shillings and the subscription of to licensee of Broadcasting station known as The licensee hereby undertakes faithfully to observe all the requirements of the relative Regulations.

The licensee also agrees, in the event of this licence not being renewed, that the licensed installation will not be operated, nor will it be disposed of, except in the manner provided for in the Regulations.

By direction of the Postmaster-General.

for Broadcasting Station Licensee.

Date

Signature of licensee.
Date.

Form 6.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

DEALER'S LICENCE.

H In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence to (name) (address)

to deal in wireless apparatus for a period of twelve calendar months from The sale, hire or disposal of wireless apparatus by the licensee shall be in accordance with the said Regulations, and any such amendments and additions thereto as are made from time to time.

By direction of the Postmaster-General,
Chief Manager Telegraphs and Wireless.
Date

1. No of licence. Expires
2. Location of dealer's premises
Signature of licensee
Date

COMMONWEALTH OF AUSTRALIA.
Form.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

EXPERIMENTAL LICENCE (TRANSMITTING AND RECEIVING).

I In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect an experimental wireless station at and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General,
Chief Manager, Telegraphs and Wireless.
Date

SCHEDULE
OF THE AUTHORISED STATION.

1. No. of licence. Expires
2. Name of licensee.
3. Location of station.
4. Type of receiver.
5. Type of transmitter power watts.
6. Operating wavelength. Call sign.
Signature of licensee
Date

Form 8.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY, 1905-1919.

EXPERIMENTAL LICENCE (RECEIVING ONLY.)

J In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Section 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations a licence is granted to

to erect an experimental wireless station at _____ and to, operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.
Chief Manager Telegraphs and Wireless.
Date _____

SCHEDULE
OF THE AUTHORISED STATION.

1. No. of licence. Expires
2. Name of Licensee
3. Location of station
4. Type of receiver
Signature of licensee
Date

Form 9.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

PORTABLE STATION LICENCE.

K In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a wireless portable station in accordance with particulars in the Schedule, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.
Chief Manager Telegraphs and Wireless.
Date _____

SCHEDULE OF THE AUTHORISED
STATION.

1. No. of licence Expires
2. Area within which transport and operation of set is permitted.
3. Stations with which communication is permitted.
4. Description of the transmitting apparatus licensed.
5. Description of the receiving apparatus licensed.
6. Wavelength
7. Maximum energy permitted to be employed in transmitter.

Signature of licensee.

Date.

Form 10.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS TELEGRAPHY ACT, 1905-1919.

AIRCRAFT STATION LICENCE.

L In pursuance and exercise of the powers and authority conferred upon the Postmaster-General by Clause 5 of the Wireless Telegraphy Act, 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

to erect a wireless Aircraft Station on aircraft described as _____ employed on _____ service, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said station shall be carried out in accordance with the provisions of the said Regulations, as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorised in writing by the Postmaster-General.

By direction of the Postmaster-General.
Chief Manager Telegraphs and Wireless.
Date.

SCHEDULE OF THE AUTHORISED
STATION.

1. No. of licence Expires.
2. Service or locality in which aircraft is employed.
3. Source of power and maximum power taken by transmitter.
4. Normal range in nautical miles—
(a) By day
(b) By night
5. System of radiotelegraphy with the characteristics of the system of emission.
6. Wavelengths in metres (the normal wavelength is underlined).
7. Charge per word for traffic.
8. Stations with which communication is permitted.
9. Nature of services performed.

Signature of licensee.
Date.

(Coat of Arms).

COMMONWEALTH OF AUSTRALIA.

Certificate No. Form 11.

CERTIFICATE OF PROFICIENCY IN
RADIOTELEGRAPHY.

GRANTED BY THE POSTMASTER-GENERAL
FIRST CLASS.

M This is to certify that, under the provisions of the International Radiotelegraphic Convention and the Wireless Telegraphy Act, 1905-1919, Mr.

has been examined in Radiotelegraphy, and has passed in—

(a) The adjustment of apparatus and knowledge of its working.

(b) Transmission and sound-reading at a speed of not less than twenty words a minute.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

The candidate is proficient in the following systems :—

It is also certified hereby that the holder has made a legal declaration that he will preserve the secrecy of correspondence.

Signature of Certifying Officer—

Chief Manager Telegraphs and Wireless.
Secretary, Postmaster-General's Department
Date.

Signature of Holder.

Date of Birth.

Place of Birth.

N.B.—This certificate may be indorsed, or withdrawn at the discretion of the Minister, in case of misconduct or breach of the Regulations on the part of the holder. Unless so withdrawn, it will continue to be valid so long as the Regulations of the Radiotelegraphic Convention concluded in London in 1912 remain in force.

Form 12.

COMMONWEALTH OF AUSTRALIA.

CERTIFICATE OF PROFICIENCY AS A WATCHER IN RADIOTELEGRAPHY.

GRANTED BY THE POSTMASTER-GENERAL.

N This is to certify that, under the provisions of the Navigation Act, 1912-1920, Mr. _____ has been examined in Radiotelegraphy, and—

(a) Is capable of receiving and understanding the Radiotelegraph Distress Signal and the Alarm Signal;

(b) Has sufficient knowledge of the apparatus on which he will be required to keep watch to know by means of a buzzer or other simple test that it is in proper condition to receive signals.

It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer.

The holder of this Certificate is therefore authorised to perform the duties of a Watcher in Radiotelegraphy.

For Secretary, Postmaster-General's Department.
Date.

Signature of Holder.

Date of Birth

Place of Birth

Form 13.

COMMONWEALTH OF AUSTRALIA.

STATUTORY DECLARATION REGARDING SECRECY OF WIRELESS COMMUNICATIONS.

O (1) I, _____ of _____ in the State of _____ do solemnly and sincerely declare :—

1. That I will hold strictly secret all wireless telegraphic or telephonic or other communi-

cations that may pass through my hands, or come to my knowledge in—

(a) Conducting experiments in wireless telegraphy or telephony, in accordance with Licence No. _____ granted to me; or

(b) The execution of the wireless telegraphic or telephonic duties entrusted to me.

2. That I will not directly or indirectly either divulge to any person (other than a properly authorised official of the Commonwealth of Australia, or a competent legal tribunal), or make any use whatever of any message or information coming to my knowledge by reason of the licensed installation. If employed as an operator at a station licensed to conduct commercial wireless traffic I will not give any information directly or indirectly respecting such messages or communications except to the persons for whom such messages or communications are intended or to any authorised officials of the Commonwealth of Australia or authorised official of my employer.

3. That I will not transmit or cause to be transmitted by wireless telegraphy or telephony any message received by me for transmission, or deliver or cause to be delivered to any person any messages received by me by wireless telegraphy or telephony, unless the delivery of such message has been approved by the Minister for the time being administering the Wireless Telegraphy Act, 1905-1919, or by an officer duly authorised by him to approve thereof.

And I make this solemn declaration by virtue of the Statutory Declarations Act, 1911, conscientiously believing the statements contained therein to be true in every particular.

(2)

Declared at _____ the _____ day of _____ 192____
Before me

(3)

(4)

NOTE.—Any person who wilfully makes a false statement in a statutory declaration is guilty of an indictable offence, and is liable to imprisonment, with or without hard labour, for four years.

N.B.—To be signed before a Justice of the Peace or a Commissioner for Declarations, and returned to the Chief Manager Telegraphs and Wireless, Postmaster-General's Department, Melbourne.

z

Form 14.

(Front of Card).

Coat of Arms.

COMMONWEALTH OF AUSTRALIA.

CARD OF AUTHORITY TO INSTALL AND OPERATE WIRELESS INSTALLATION ON PORTABLE AIRCRAFT STATION.

ISSUED BY ORDER OF THE POSTMASTER-GENERAL.

(Inside of Card.)

POSTMASTER-GENERAL'S DEPARTMENT.

WIRELESS BRANCH, MELBOURNE.

D to

The bearer, Mr.
address

has been authorised by the Postmaster-General to install and operate wireless telegraph apparatus for receiving and transmitting within a locality described as from to wireless telegraph apparatus is installed thereon.

Chief Manager Telegraphs and Wireless.

NAVIGATION ACT.

P The Commonwealth Parliament passed in 1912 a Navigation Act which contains a clause making it compulsory for ships trading in Australian waters to be equipped with apparatus for wireless telegraphy. This matter is dealt with in section 231 of the Act, and the text of the section given below is as under :—

EXTRACT FROM NAVIGATION ACT,

1912.

DIVISION VI.

231. (1) Except as prescribed, every foreign-going ship, Australian trade ship, or ship engaged in the coasting trade, carrying fifty or more persons, including passengers and crew, shall before going to sea from any port in Australia be equipped with an efficient apparatus for wireless communication in good working order in charge of one or more persons holding prescribed certificates of skill in the use of such apparatus.

(2) For the purposes of this section apparatus or wireless communication shall not be deemed to be efficient unless :

(a) It is capable of transmitting and receiving messages over a distance of at least 100 miles, day and night.

(b) The person controlling the operator undertakes in writing to the Minister to exchange, and does, in fact, exchange, as far as may be physically practicable (of which the master shall be the judge) messages with shore or ship stations using similar or other systems of wireless communication ; and

(c) There is provided, in connection with the apparatus, and ready for use whenever from any cause the ordinary supply of electrical power is not available, a battery of accumulators of such capacity as to insure for a period of at least six hours communication of the efficiency prescribed in paragraph (a) of this sub-section.

(3) The equipment shall, if so prescribed, include a silent chamber for the receipt of messages.

(4) The master of a ship required by this section of the regulations to be equipped with wireless telegraphy apparatus shall not take her to sea, and the owner of a ship required to be so equipped shall not permit her to go to sea, unless the requirements of this section have been complied with.

PENALTY : One Thousand Pounds.

(5) The regulations may prescribe the times and hours during which an operator shall be in attendance on the apparatus, ready to receive or transmit messages,

(6) Except as otherwise prescribed, the provisions of this section shall not apply to ships plying exclusively between ports in Australia less than two hundred miles apart.

(7) The Governor-General may make regulations in accordance with the provisions of any International Convention to which the United Kingdom is a party relating to the use of wireless telegraphy on ships, and such regulations may be in addition to, or in substitution either wholly or in part for the provisions of this section.

STATUTORY RULES.

1921. No. 104.

REGULATIONS UNDER THE NAVIGATION ACT,
1912-1920.

Q I, the Governor-General, in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this twelfth day of May, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,

W. MASSY GREENE,

Minister of State for Trade and Customs.

NAVIGATION (WIRELESS TELEGRAPHY)

REGULATIONS.

1. These Regulations may be cited as the Navigation (Wireless Telegraphy) Regulations, 1921.

2. In these Regulations, unless the contrary intention appears—

"Automatic Apparatus" means an automatic apparatus approved by the Board of Trade of the United Kingdom ;

"On Watch" means on watch in the wireless telegraph room of the ship ;

"Signal of Distress" means the wireless distress call as specified in Schedule IV to the Act ; and

"The Act" means the Navigation Act, 1912-1920.

3. (1) Subject to the next succeeding sub-regulation, these Regulations shall apply to ships (British and foreign) of the classes enumerated in the next succeeding Regulation which—

(a) Carry more than twelve passengers ; or

(b) Are of sixteen hundred tons gross registered tonnage or upwards.

(2) These Regulations shall not apply to—

(a) River and bay ships ;

(b) Limited coast-trade ships which do not trade beyond 100 nautical miles from principal port of departure ; or

(c) Ships not registered in Australia (other than British ships regularly employed in trading from a port in the Commonwealth) unless they take on board, at a port in the Commonwealth, passengers to be conveyed to another port, within or without the Commonwealth.

4. (1) For the purposes of these Regulations ships shall be classified as follows :—

Class I.—Australian trade and foreign-going ships carrying 200 or more persons.

Class II.—(a) Australian-trade and foreign going ships carrying 50 but less than 200 persons ; and

(b) Limited coast-trade ships carrying 50 or more persons ; and

Class III.—Ships carrying less than 50 persons

(2) In computing, for the purposes of this Regulation, the number of persons carried by a ship, there shall be included the normal crew of the ship and the maximum number of passengers provided for in the passenger certificate (if any) of the ship.

(3) Until the first day of October One thousand nine hundred and twenty-two all foreign going ships, when actually carrying less than two hundred persons, including passengers and crew, and proceeding between ports of call in the Commonwealth, shall, notwithstanding anything contained in this regulation, be deemed to be classified in Class III.

5. Those ships only to which these Regulations apply shall be ships which are required to be provided with a wireless telegraph installation, to maintain a wireless telegraph service and to be provided with certificated operators and watchers in accordance with section 231 of the Act.

6. (1) The wireless telegraph installation with which ships are to be provided in accordance with section 231 of the Act shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention for the Safety of Life at Sea, 1914), or of any international agreement superseding the International Radiotelegraph Convention, 1912.

(2) In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade of the United Kingdom, a ship of Class III shall be provided, in addition, with such an apparatus unless the normal duration of the voyage of the ship from one port of call to the next does not exceed eight hours.

7. The installation shall be of the spark or interrupted continuous wave type.

8. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this Regulation as to emergency installations as well as the requirements as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting, by day, under normal conditions and circumstances, clearly perceptible signals from ship to ship over a range of at least 100 nautical miles.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of this Regulation as to range if it is able to maintain, over sea, by day, with a Post Office Standard station when employing a receiver without amplification devices, communication on a 600-metre wave at a range of one and a-half times the number of nautical miles respectively prescribed by this Regulation.

9. There shall be provided, between the bridge and the wireless telegraph room, means of communication by voice pipe, telephone or other means approved by the Director of Navigation, and an operator or watcher when

on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

10. If not fitted with automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. Two operators, of whom one shall hold a First or a Second Grade Certificate.

(c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Regulations, and either a certificated operator or a certificated watcher shall always be on watch at other times:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and two watchers.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate, and one watcher.

(c) Voyage not exceeding 8 hours from port to port. One operator, who shall hold a First or a Second Grade Certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall always be on watch at the times specified in the Schedule to these Regulations:

Provided that if the duration of the voyage on which the ship is employed does not exceed eight hours from port to port the operator shall be on watch during the whole time of the voyage.

11. If fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by a certificated operator, or by a watcher, or by means of the automatic apparatus:—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

(a) Voyage exceeding 48 hours from port to port. Two operators, one of whom shall hold a First Grade Certificate.

(b) Voyage not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II or III shall carry one operator, who shall hold a First or a Second Grade Certificate, and while the ship is at sea

the operator shall be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by an operator, or by a watcher, or by means of the automatic apparatus:

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, the operator shall not while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Regulations.

12. For the purposes of the last two preceding Regulations, the number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between the port of call and the next.

13. (1) For the purposes of these Regulations:

(a) An operator shall be deemed to hold a First Grade Certificate if he holds a First Class Certificate of Proficiency issued by the Postmaster-General under the Wireless Telegraphy Regulations 1920 (being Statutory Rules, 1920, No. 256) made under the Wireless Telegraph Act 1905-1919, and has had at least three years' experience as an operator.

(b) An operator shall be deemed to hold a Second Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has at least one year's experience as an operator;

(c) An operator shall be deemed to hold a Third Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has had less than one year's experience as an operator; and

(d) A watcher means a watcher certificated by the Postmaster-General, or by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force.

(2) First, Second or Third Grade Certificates, or equivalent certificates, granted to operators by the Government or any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force, shall be accepted as First, Second or Third Grade Certificates within the meaning of these Regulations.

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time*	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa, Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A.	Meridian of 90° East	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. to the South of the Coast of America; West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. to the South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

* NOTE.—Following the practice adopted in the Merchant Shipping (Wireless Telegraphy) Rules, 1920, issued by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919, Greenwich Mean Time is, for the purposes of this Schedule, reckoned from *midnight*, and not from *midday*.

STATUTORY RULES.

1921. No. 132.

REGULATIONS UNDER THE NAVIGATION ACT,
1912-1920.

R I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this fourteenth day of July, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,

W. MASSY GREENE,

Minister of State for Trade and Customs.

AMENDMENT OF NAVIGATION (WIRELESS TELE-
GRAPHY) REGULATIONS.

(Statutory Rules, 1921, No. 104.)

Regulation 4 of the Navigation (Wireless Telegraphy) Regulations is amended by inserting at the end of sub-regulation (1) the following proviso:—

" Provided that, until the first day of October, One thousand nine hundred and twenty-two, all Australian trade and limited coast trade ships to which these Regulations apply shall be deemed to be classified in Class III."

STATUTORY RULES.

1921. No. 179.

REGULATIONS UNDER THE NAVIGATION ACT,
1912-1920.

(Second Amendment, 1921).

S I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921:—

Dated this fourteenth day of September, 1921.

FORSTER,

Governor-General.

By His Excellency's Command,

W. MASSY GREENE,

Minister of State for Trade and Customs.

Amendment of Navigation (Wireless Telegraphy) Regulations. (Statutory Rules, 1921, No. 104.)

The Navigation (Wireless Telegraphy) Regulations 1921 are amended:—

(a) By inserting at the end of paragraph (b) of sub-regulation (1) of regulation 13 the following proviso:—

" Provided that, where it is shown to the satisfaction of the Director of Navigation that a sufficiency of operators holding First or Second Class Certificates of Proficiency issued by the Postmaster-General and having at least one year's experience as an operator are not available in the Commonwealth, he may to the extent of the deficiency in number of such operators, by writing under his hand, permit of the employment, as Second Grade Operators, of persons holding First or Second Class Certificates of Proficiency but with less than one year's experience as operators, and such persons so employed shall be deemed to be Second Grade Operators for the purposes of these Regulations"; and

(b) By inserting at the end of the Schedule thereto the following proviso:—

" Provided that, until otherwise prescribed, the time of watch for operators on Australian trade and limited coast-trade ships to which these Regulations apply may, in lieu of those set out in the schedule, and at the option of the owner, be in accordance with the provisions of the agreement between the Commonwealth Steamship Owners' Association and others of the one part and the Radio-Telegraphists' (Marine) Institute of Australasia of the other part, dated the 29th March, 1920, certified in the Commonwealth Court of Conciliation and Arbitration on 22nd September, 1902."

AUSTRIA

(See Maps 2 and 8)

THE Republic of Austria, proclaimed on November 12th, 1918, constitutes but a small portion of the former Austro-Hungarian Monarchy.

CONTROL AND ORGANISATION.

The Austrian Telegraph Authorities possess at present two long range stations, one in Deutsch Altenburg, the other in Laaerberg, near Vienna. These stations communicate with foreign countries (Bucharest, Crakow, Coltano, Lyons, Moscow, Pozen, St. Pierre, Sarajevo, Sofia), and broadcast weather reports, time signals, and financial news. There is a third smaller station in Vienna (Stubenring) for internal communications and service with neighbouring countries. Three stations for receiving only are installed at Vienna-Burg, Vienna-Exchange (for European broadcast service), Innsbruck (for Berne broadcast service). All these stations are under the control of the Federal Ministry of Commerce and Communications and the General Direction of Posts and Telegraphs. The Austrian Telegraph Authorities, with the sanction of the International council, have granted a concession to the Austrian Marconi Company, Ltd., for a wireless telegraph service with foreign countries. With regard to Inland wireless telegraph and telephone services, negotiations are still pending.

There are no amateur or experimental societies or clubs in Austria at the present time.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Anton Stachel.	Chief of Section VII for Telegraphs, Telephones, and Pneumatic Postal Affairs, Public Department of Communications	Vienna, 1 Borse platz, 1
Friedrich Teufenstein	Chief of the Telegraph and Telephone Department	Vienna

ADMINISTRATION.

In accordance with order made by the Ministry of Commerce on January 7th, 1910, printed below, the establishment and working of wireless telegraph and telephone installations within the territory of the Austrian Republic and on Austrian ships, are subject to State concessions. No special regulations relating to the general working of aircraft services, time signals, meteorological, weather reports, hydrographic information, etc., have yet been published, nor have any D.F. stations been authorised.

A—Decree of Ministry of Commerce, January 7th, 1910.

A The following Decree of the Ministry of Commerce, dated January 7th, 1910, is concerned with wireless telegraph stations in the Austrian Empire, on board Austrian ships, and on ships of foreign nationality in Austrian territorial waters:—

(1) In accordance with a High Decree of Parliament of January 16th, 1847, and the Decree of the Ministry of Commerce, dated April 28th, 1905, the erection and working of Wireless Telegraph stations in the Austrian Empire and on Austrian ships is a State concession to acquire which a written application (liable to Stamp Duty) containing a description of the station and a diagram of connections, must be submitted.

(2) The choice of system, apparatus, and fixtures, as well as the establishment of coast and land rates within the limits of the Wireless Telegraph Agreement of 1909, and the supplemental regulations are the prerogative of the Ministry of Commerce.

(3) The general regulations for Wireless Telegraph stations on board ships are shown below.

(4) Wireless Telegraph stations on board ships must fulfil the following conditions:—

(a) They must be of equal technical efficiency to systems other than that adopted in the stations, and they must be able to inter-communicate with other systems.

(b) The system adopted must be one of "syntonisation."

(c) The speed of transmission and reception must not, under normal circumstances, be less than twelve words (each of five letters) per minute.

(d) The power possessed by the apparatus must not exceed, in normal conditions, 1 kilowatt. A greater power can be used when the ship is under an obligation to exchange messages at a longer distance than 300 kilometres from the nearest coast station, or when the transmission can only be effected by means of a higher power than specified.

(5) The working of Wireless Telegraph stations on board foreign ships in Austrian territorial waters is dependent upon the previous grant of a State concession. This regulation does not apply to warships or ships in distress. If a foreign vessel employs it Wireless Telegraph station without authorisation, the State authorities may take steps to prevent the working of the station in Austrian territorial waters.

BASUTOLAND

(See Maps 25 and 32.)

BASUTOLAND is governed by a resident Commissioner under the direction of the High Commissioner for South Africa and located at Maseru, its principal town. The latter high official possesses legislative authority which is exercised by proclamation.

ADMINISTRATION.

In 1904 a proclamation was issued, which we print below, making provision for the working of wireless telegraphy within the territory, but at present there are no wireless stations.

A—Proclamation making provision for Wireless Telegraphy.

A PROCLAMATION.

No. 5 of 1904.

By His Excellency the High Commissioner for South Africa.

Whereas it is expedient to make provision for the working of wireless telegraphy within the territory of Basutoland;

Now therefore by virtue of the powers in me vested I do hereby proclaim, declare and make known as follows:

1. No person shall establish or use any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires without having previously obtained a licence as hereinafter provided.

2. (1) It shall be lawful for the Resident Commissioner to authorise the issue of a licence for either of the purposes mentioned in section 1 and to revoke the same at any time, and there shall be payable in respect of such licence the sum of one hundred pounds.

(2) Every such licence shall be deemed to be granted upon such terms and conditions as

the High Commissioner may from time to time prescribe by notice in the *Gazette*.

3. Any person who shall establish or use or attempt to establish or use any such apparatus or installation as is mentioned in section 1 in contravention of the provisions of this Proclamation shall be liable upon conviction to a penalty not exceeding two hundred and fifty pounds and in default of payment to imprisonment with or without hard labour for a period not exceeding three months and in case of a second or subsequent conviction to a penalty not exceeding five hundred pounds or in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

4. This proclamation shall take effect from the date of its publication in the *Gazette*.

Given under my hand and seal at Johannesburg this twenty-fourth day of February, One thousand nine hundred and four.

MILNER,

High Commissioner.

BECHUANALAND PROTECTORATE

(See Maps 25 and 32.)

IS under the government of a Resident Commissioner with headquarters at Mafeking in the Cape Province.

In view of the geographical position of that part of the territory of South-West Africa, east of longitude 21 deg. East, known as Caprivi Zipfel; the Zipfel is now administered as if it were a portion of the Bechuanaland Protectorate.

ADMINISTRATION.

With the exception of the passing of legislation making provision for the working of Wireless Telegraphy within the Protectorate nothing has taken place in connection with Wireless Telegraphy and Telephony.

BELGIAN CONGO

(See MAPS 25, 26, 28 and 29.)

THE governing body of the colony consists of 14 members, the King being represented by a Governor-General assisted by several provincial governors.

CONTROL.

The Wireless Telegraph Service is controlled by the Ministry for the Colonies, and has a general directorate at Brussels and a local directorate at Stanleyville.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Lt.-Col. Albert Wibier	Director-General	At Brussels.
Mr. Louis Van Cleynenbreugel ..	Secretary	Do.
Mr. Paul Duchateau	Engineer	Do.
Mr. Raymond Braillard	Consulting Engineer	Do.
Mr. Fernand Bourguet	Director	Do.
Mr. Auguste Mathieu	Chief of Section	At Stanleyville.
Mr. Guido Vinay	"	Do.
Mr. Hubert Melchior	Controller	Do.
Mr. François Van Calck	"	Do.
Mr. André Vanderveken	"	Do.

There are now 15 stations in operation in the Belgian Congo.

There are no stations used for aviation purposes.

All stations pick up the press telegrams from Europe.

STATIONS COMPLETED OR UNDER CONSTRUCTION.

The network with Boma at the head is divided into the following sections:—

Bas-Congo-Kasai Section.—Boma (Kanga), 750 kW. arc under construction; Banana O.N.A., Kinshasa and Lusambo, 5 kW. spark.

Equator Section.—Coquilhatville, 7 kW. arc; Basankusu, Umangi, Basoko and Buta, 5 kW. spark.

Stanleyville Section.—Stanleyville (Sololo), 70 kW. arc under construction (to communicate direct with Elizabethville, Boma and Bunia-Kilo); Stanleyville and Bunia-Kilo, 5 kW. spark.

Lualaba Section.—Kindu, Kongolo, Lukuga and Kikondja, 5 kW. spark.

There is a 5 kW. spark station at Elizabethville (Kafubu), where a 70 kW. arc is under construction to communicate direct with Boma (Kanga) and Stanleyville.

The 1½ kW. stations at Kigoma and Usumbura, on Lake Tanganyika, are to be converted and enlarged.

There are radiotelephonic stations at Tshikapa, Charlesville and Dundu.

ADMINISTRATION.

The rules under which radiotelegraphy is administered in the colony are those in force for the Wired Telegraphic Service.

A bill is in preparation for regulating the erection of transmitting stations and granting licences for the reception of radiotelegraphy and telephony.

BELGIUM

(See Maps 2 and 11)

BELGIUM is a "Constitutional Representative and Hereditary Monarchy," the legislative power being vested in the King, the Senate and the Chamber of Representatives. The present King Albert, born on April 8th, 1875, succeeded his uncle on December 17th, 1909.

CONTROL.

Wireless telegraphy in Belgium is under the control of (a) the Ministry of National Defence with regard to the Army, Navy and Military and Civil Aviation. (b) The Telegraph and Telephone Administration, which forms one of the departments of the Ministry of Railways, Marine, Posts and Telegraphs, controls public service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. X. Neujean ..	Minister of Railways, Posts and Telegraphs ..	Brussels
Mr. A. Roosen ..	Director-General of Telegraphs and Telephones ..	Do.
Mr. Pierrard ..	Director-General of Marine ..	Do.
Mr. E. Piérard ..	Chief Engineer, Director of Telegraph Administration ..	Do.
Mr. A. Deldime ..	Director of Telegraph Administration ..	Do.
Mr. d'Ardenne ..	Chief Engineer, Director of Service, Chief of Technical Office, Telegraph Department ..	Do.
Mr. M. Henrion ..	Chief Engineer, Director of the Service of Special Apparatus, Radiotelegraphy and Radiotelephony ..	Do.
Mr. Salzet ..	Principal Engineer, Technical Office, Telegraph Department ..	Do.
Mr. R. Corteil ..	Principal Engineer, Wireless Section ..	Do.
Mr. C. Caenepenne ..	Engineer, Wireless Section ..	Do.
Mr. R. Lequeux ..	Engineer, Service of Special Apparatus, Radiotelegraphy and Radiotelephony ..	Do.
Mr. Van Heemstée ..	Assistant Engineer, Wireless Section ..	Do.

ADMINISTRATION.

The administration of Wireless Telegraphy in Belgium is regulated by a Law and Royal Decrees, which are reprinted below:—

- A—Law of July 10th, 1908, regulating the use of wireless telegraphy and telephony.
- B—Royal Decree of October 19th, 1908, regulating the application of charges on wireless messages.
- C—Royal Decree of November 3rd, 1913, regulating the conditions of installation and the working of wireless stations.
- D—Decree regulating ships' licences, September 10th, 1918.
- E—Technical and administrative regulations relating to ship stations, October 15th, 1918.*
- F—Circular No. 1 of October 18th, 1918, addressed to shipowners.
- G—Decree of August 7th, 1920, regarding Amateur Wireless installations.
- H—Extracts from Royal Decree of November 8th, 1920, relating to regulations for ships.

A 1. LAW OF JULY 10TH, 1908, RELATING TO TELEGRAPHY AND TELEPHONY BY ETHER TRANSMISSION.

ART. 1.—The Government is authorised to undertake the establishment and transmission of wireless telegraphy and telephony by ether waves.

ART. 2.—On Belgian territory or on board of a Belgian steamer or vessel no one is allowed without authorisation previously obtained from the Government to erect, establish or cause to be erected or work apparatus for radio transmission capable of carrying out or prejudicing communications.

Each infraction of the clauses of the provisions of the present Article involves liability to a fine varying from 200 to 2,000 francs, together with imprisonment varying from eight days to a year, or either of these penalties alternatively. Such infringement will carry the additional penalty of confiscation for the benefit of the State of the apparatus and all other objects specially designed for their working. Moreover, the Law Officers shall be able to order suspension in the carrying out of the confiscation of all apparatus and other objects or of a part thereof by placing them in temporary sequestration for a term which may be fixed by the tribunal. This sequestration shall be raised if the interested party or his legal representative shall obtain authorisation to make use of the apparatus. In default of such authorisations, the confiscation of his effects shall take place immediately on the expiry of the term fixed under the judgment, unless the competent Minister shall authorise the delinquent either to destroy the apparatus or to transfer its possession to a duly authorised concessionaire.

The preceding arrangements shall apply even in case of acquittal of the accused, when it has been established that the apparatus and other objects giving rise to the prosecution come under the category covered by the two first paragraphs of the present Article.

ART. 3.—The Government shall fix the rates, as well as the rules of administration and order relative to radiotelegraphy and telephony.

Infringement shall be punished in accordance with the penalties established by the law of March 6th, 1908.

ART. 4.—The authorisations referred to in Art. 2 are granted by the Minister exercising jurisdiction over the telegraphic and telephonic services in agreement with the other ministers affected. They shall specifically enumerate their duration, the conditions of installation, use of apparatus, charges where such are made, royalties payable to the public treasury, penalties for infringement and all other limiting conditions, dictated by the interests of public order, as well as by the security and defence of the realm. In the event of infringement of the conditions of authorisation, the latter may be withdrawn by the Minister who granted it. Nevertheless, no royalty can be claimed when it has been proved to the satisfaction of the Minister in Charge of the granting of authorisations that the applicant has no other object than that of experimenting with or making use of the apparatus for his private purpose without making any charge whatsoever.

ART. 5.—No one can establish or work on board a foreign ship or vessel apparatus or radio transmission which can carry out or prejudice radiotelegraphic or radiotelephonic communication, so long as the ship, or vessel, is located in Belgian Territorial Waters, if its action be not in accord with the prescribed regulations set out in Art. 3. The competent Minister may at any time forbid the use of apparatus, or lay down with regard thereto such measures of precaution, supervision and control as he judges necessary.

All infringements of the regulations of the present Article are liable to a fine of 100 to 500 francs. The Law Officers may order the sequestration of apparatus, and of all other objects specifically adapted to their working, for the duration of the stay of the aforesaid vessel in Belgian waters. Such sequestration may be annulled if the interested party obtain from the competent Minister an authorisation to make use of the apparatus in question.

* The Regulations of October 15th, 1918, are specially adapted for wartime, and will soon be modified to suit peace conditions.

If, after the annulment of the sequestration, the interested party commits a fresh infraction of the conditions laid down, the fine may be doubled and the apparatus and other objects confiscated for the benefit of the State.

ART. 6.—If for any cause, either by reason of public order or the security and defence of the realm, the Government shall judge necessary to suspend the whole, or part of the service, the concessionaire shall be obliged to obey the first instructions given him to that end.

In the same circumstances the competent Minister may either order the apparatus to be put out of action or sequestered, or he may put the apparatus in the hands of his own agents instead of those of the concessionaires. These measures shall be taken for the duration of the period judged necessary by the Government and shall give rise to no claim for indemnification at the hands of the State.

ART. 7.—The penal laws relative to wireless telegraphy and telephony are applicable to Governmental radiotelegraphy and telephony, as well as to such installations and services as have been duly authorised for public communication.

ART. 8.—The Government may designate the functionaries who shall be sworn in as officers of judiciary police for the investigation of the infringement relative to wireless telegraphy and telephony. The official reports drawn up by these functionaries shall be considered correct until they are proved otherwise.

The above-mentioned functionaries shall take precedence, so far as infringements relative to wireless telegraphy and telephony are concerned over all other officers of judiciary police, with the exception of the Public Prosecutor and the Police Magistrate.

ART. 9.—When there are found to be sufficient traces of the existence of wireless telegraph or telephone installations not regularly authorised or employed, the police magistrates shall visit the localities in which the aforesaid installations shall be presumed to exist, in order to make all necessary investigations into the truth of the allegations, even although it may be necessary to secure access to private property for that purpose.

He may take with himself one or more experts or functionaries sworn in in accordance with the terms of the preceding Article.

He may either effect himself or cause to be effected, by any and all of the officers of the judiciary police, seizure or dismantlement or temporary sequestration of the apparatus set up or employed without regular authorisation, as well as that of all other objects subject to confiscation in accordance with the terms of Arts. 2 and 5 heretofore set out.

ART. 10.—The State undertakes no responsibility for the service of communication by radiotelegraphic or radiotelephonic means.

ART. 11.—The present law shall come into operation the day after its publication.

relating to wireless telegraphy and telephony;

In view of the International Radiotelegraphic Convention concluded at Berlin in 1906 and the further Acts which complete it;

and

Inasmuch as it is desirable to simplify—so far as charges are concerned—the formalities which appertain to the delivery of Acts authorising the establishment and working of ether transmission, at the suggestion of our Minister of Railways WE HEREBY AGREE:

Sole Article.—Within the limits fixed by the International Convention relating to Radiotelegraphy and Telephony, our Minister of Railways, Posts and Telegraphs is hereby authorised to settle the amount of charges, when such arise, in the authorisations which he is empowered to issue under the authority of Articles II and III of the Law of the 10th July, 1908.

Given at Laeken, the 29th October, 1908.

(Sgd.) LEOPOLD.

C 3.—ROYAL DECREE OF THE 3RD NOVEMBER, 1913, RELATING TO THE CONDITIONS UNDER WHICH WIRELESS TELEGRAPHY SHALL BE INSTALLED AND WORKED.

In view of Art. III of the Law of 10th July, 1908, which authorises the Government to settle the rules of administration and police relative to radiotelegraphy and telephony:

In view of the Law of 16th March, 1908, relating to the penalties incurred by contravention of general measures of interior administration, as well as to the penalties which may be inflicted under the rules laid down by provincial and communal authorities;

and

In view of the proposal of our Minister of Marine, Posts and Telegraphs, WE HAVE SETTLED AND HEREBY DECREE:

ART. 1.—On Belgian territory and on board ships or vessels of Belgian nationality, every and each proposal for the installation of apparatus for ether transmission, capable of assisting or prejudicing the transmission or reception of radiotelegraphic or radiotelephonic signals, as well as all proposals for modification in their employment, and also every and each proposal for the erection or modification of an installation which has already been duly authorised, ought to be submitted to the Department of Marine, Posts and Telegraphs as a preliminary to their starting operations.

Any request for authorisation must indicate the character of the installation, the object of its use, so far as concerns wireless stations on board ship, tariff of charges proposed, detailed list of the apparatus and of the methods of working, wavelengths, hours of watch, and generally all information of a character such as will facilitate detailed examination of the scheme. There shall be moreover thereon set forth the steps it is proposed to take to prevent interference with the service of other official or authorised stations.

ART. 2.—Such authorisations are issued subject to the reservations and conditions which may be judged necessary in the interests of the convenience and defence of the realm, including the safeguarding of public and service messages.

ART. 3.—A new authorisation becomes necessary:

1. If the station has not been installed or modified and put in working order within the period fixed by the Decree of Authorisation.

B 2.—ROYAL DECREE OF THE 19TH OCTOBER, 1908, RELATING TO CHARGES FOR RADIO-TELEGRAMS.

Royal Decree authorising the Minister of Railways, Posts and Telegraphs to settle the amount of charges fixed when necessary in the authorisation for delivery by application of Articles II and IV of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony by ether transmission.

In view of the Law of the 10th July, 1908,

2. If it has been put in working order or made use of under the conditions other than those set out in the Decree of Authorisation.

ART. 4.—Installations not regularly authorised which shall have been set up previous to the coming into force of the present Decree shall not be privileged thereby: their service must be suspended and a request for authorisation applied for under the conditions and forms set out under Article I of the present Decree.

ART. 5.—On entering into Belgian territorial waters foreign ships fitted with wireless installations capable of assisting or prejudicing transmission or reception of radiotelegraphic or radiotelephonic signals shall cease communication with any neighbouring stations other than the nearest State stations. They shall announce their presence to these coastal stations and await authorisation or invitation to communicate either with the aforesaid or some other coastal station.

The preceding arrangements shall not apply to foreign ships and vessels, provided that previous to their entering within Belgian territorial waters they shall have been provided under order of the competent Belgian Minister with his special and regularly accredited permit for communication. They shall not interfere in any way with distress signals or the answers to distress signals emanating from other ships or vessels.

To sum up: Foreign ships and vessels are enjoined from the time of their entering into Belgian territorial waters to cease all working which may prejudice the communications of any radiotelegraphic or radiotelephonic stations whatsoever.

ART. 6.—On Belgian territory and within Belgian territorial waters as well as on board Belgian ships and vessels located in foreign waters, duly appointed delegates of the Government shall have free access at all hours of day and night, in accordance with Article VIII of the Law of 10th July, 1908, to all ships, vessels and steamers on which regularly authorised installations may be working, or for which a communicating permit has been granted. The owners, managers, charterers, commanders, agents, masters, and personnel are enjoined to facilitate by every possible means the duties of verification and control vested in these delegates.

ART. 7.—The owners, managers and charterers are civilly responsible for the payment of fines decreed against their commanders, directors, agents, masters, or personnel. Our Minister of Marine, Posts and Telegraphs is charged with the execution of the present Decree.

ART. 8.—The present Decree shall come into force the day after its publication dated Brussels, 3rd November, 1913.

D 4.—DECREE OF THE 10TH SEPTEMBER, 1918, RELATING TO SHIPS' LICENCES.

Albert, King of the Belgians, to all here present and to come, greeting.

In view of Art. 26 of the Constitution which confers the exercise of legislative power on the Ruling Sovereign, in concert with the Chamber of Representatives and the Senate; and in view of the impossibility of assembling the Legislative Chambers.

Under the advice of our Minister of Railways, Marine, Posts and Telegraphs, and Foreign Affairs, and in conjunction with our Ministers united in Council WE HAVE DECREED AND DO DECREE,

ART. 1.—On and after 15th October, 1918, it is enacted that before starting from either a Belgian port or a port belonging to an allied or neutral nation of Belgium, sea-going vessels engaged, or that may become engaged wholly or partially in commercial transport, must be furnished with a licence issued in the name of the Minister of Railways, Marine, Posts and Telegraphs, by the Director-General of Marine or by his representative.

ART. 2.—Other requests for licences must come from the shipowner or charterer or their agents and must be set out in writing in conformity with the provisions of a model approved by Ministerial decree.

ART. 3.—Every licence shall be issued for one or several voyages or for a limited period. Any licence given for more than a single voyage is always liable to cancellation.

ART. 4.—A licence will be refused whenever the authority entrusted with the investigation of the request shall judge that the vessel may so far as the itinerary or conditions of shipment are concerned—be utilised in a manner more convenient for national interests than it would be if the voyage were carried out under the arrangements set forth in the application, or when such a voyage as that therein set forth would unduly expose the vessels to the risks of war, which the national interests demand shall be avoided.

ART. 5.—A licence shall also be refused if the authority entrusted with the investigation of the request shall judge that by its general condition, or that if its engines, fittings, means of defence, or composition of personnel, the vessel is insufficiently well-found with regard to safety for the voyage for which the licence is being requested.

ART. 6.—Marine Commissioners, Consuls, and Agents designated for that purpose by the authority entrusted with the consideration for the request for licence, shall have the right of access at all times and in all places on board of Belgian sea-going vessels with the object of investigating whether the aforesaid vessel fulfils the conditions necessary for the granting of a licence or whether the conditions under which the licence may have already been granted are well and duly carried out.

Every owner, charterer, or master is enjoined to give the aforementioned officials every necessary aid in the discharge of their duties.

ART. 7.—The Marine Commissioner in Belgian ports and the Belgian Consul in foreign ports may, without prejudice to Art. 9 of the Decree of the 2nd February, 1916, withdraw the permission to navigate from any vessel not furnished with a licence or which shall navigate in violation of the conditions of the present Decree.

They shall be able to arrest, or have it put under arrest by the local authorities—the ship may even be prohibited from putting to sea.

ART. 8.—In the event of violation of the regulations of the present Decree, the Marine Commissioner or the Council shall draw up a circumstantial indictment, every item of which shall hold good until disproved. A copy of this indictment will be sent within 24 hours to the captain of the ship.

ART. 9.—The captain, shipowner, or charterer, who may at any time have been guilty of an offence against the regulations of the present Decree, shall be liable to imprisonment varying from a week to two years, together with a fine varying from 26 frs. to 2,000 frs., or, alternatively one of these penalties. Confiscation of the ship will be enforced, and if enforce-

ment be not possible, the tribunal shall substitute therefor the payment of a fine equal to the value of the vessel.

If there be any extenuating circumstances, the confiscation of the vessel, or the payment of a sum equal to its value, may be obviated in consideration of a payment of some sum less than its value.

ART. 10.—All the provisions of Section I of the Penal Code apply to the infringement of regulations set out in the present Decree.

ART. 11.—Any individual, Belgian or foreign, who shall commit outside the Royal domains, an offence against the present Decree, can be proceeded against in Belgium. If he does not appear, judgment may be passed in default.

ART. 12.—So far as the present Decree is concerned, by "captain" may be understood any person who exercises the captain's function on board.

We hereby promulgate the present Decree and order that it shall be sealed with the State Seal and published in the *Moniteur*.

Given at our Headquarters,
10th September, 1918.

Sealed (ALBERT).

REGULATIONS RELATING TO E TECHNICAL CONDITIONS, IN- STALLATION, UPKEEP, SURVEY AND TRAFFIC OF RADIOTELEGRAPHIC STATIONS ON BOARD BELGIAN VESSELS.*

Dated 15th October, 1918.

ART. I.

Systems of Radiotelegraphic Apparatus.

The choice of wireless apparatus and arrangements to be employed is left open under the express reservation of parliamentary approval, by the Department of Railways, Marine, Posts and Telegraphs of Belgium, which is entrusted with the supervision and control of Radiotelegraphic Installations on board Belgian ships.

Account will be principally taken of the efficiency of the system from all points of view, including the reliability of machines and apparatus, facilities for supervision, for the upkeep of the station, for the replacement of apparatus or parts which may be damaged.

It is extremely desirable, however, that choice should be made of a system with a musical note. Such a kind of note will be obligatory for vessels plying in tropical zones.

ART. 2.

Construction of Radiotelegraphic Installation (Conditions to be fulfilled).

Installations must fulfil the conditions laid down in the Radiotelegraphic Convention of London, 1912, and the supplements thereto, modified by the present code of Rules and later on by subsequent regulations.

(a) *Principal Transmitting Station.*—Radiotelegraphic installations must be able to transmit by day, from one ship to another of the same class, signals which can be clearly read under normal circumstances and conditions at the minimum distance laid down hereafter.

200 nautical miles (about 1,852 metres) for vessels of 6,000 tons and upward.

100 nautical miles for vessels of 3,000-6,000 tons.

75 nautical miles for vessels of 1,500-3,000 tons.

* These regulations are specially adapted for war time, and will soon be modified to suit peace conditions.

40 nautical miles for vessels of less than 1,500 tons.

Special conditions with regard to range may be imposed for vessels devoted partly, or wholly, to long distance passenger traffic, or such vessels as ply under special traffic conditions.

With the object of enabling the operator to keep himself effectively in touch with, and to regulate the working of the transmitting station, and the energy radiated therefrom by the antennæ-earth circuits, there shall be supplied an unshunted thermal ammeter, specially adapted for measuring currents of high frequency.

It must be possible to pass rapidly from a wavelength of 600 metres to that of 300 metres and *vice versa*.

(b) *Apparatus for Syntonisation and Reception.*—Besides the regulating arrangements relative to the reception of wavelengths of 600 metres or less (see Service Regulation annexed to the London Convention of 1914, Art. 7, Section C), the apparatus must allow for reception, with a margin of insurance against interference of transmissions operated on a wavelength up to 3,000 metres.

Use must be made of sensitive and very stable detectors specially adapted for the reception of musical notes.

The reception apparatus must include at least two detectors.

Arrangements must be made for avoiding any induction due to badly established electric circuits, or to any other cause which may tend to obscure faint signals.

Some suitable arrangement must ensure the silence of receiving telephones during transmission, whether the latter is being made through the main station or the emergency set.

A suitable and conveniently placed buzzer must be carried for the verification of the satisfactory working of the different circuits of the reception apparatus and of the detectors.

(c) *Emergency Transmitting Gear.*—Every board-ship station, whatever may be the constitution of its principal Transmitting Station, must include an emergency set, in conformity with Act II of the Regulations of Service appended to the International Radiotelegraphic Convention of London, with the object of ensuring the possibility of reception when the current of the ship's generator fails, or some mischance puts the principal station out of action.

This emergency set must of necessity be actuated by an accumulator battery with a sufficient capacity and of at least 24 volts. If, however, the principal transmitting station carries an accumulator battery suitably equipped and located, this battery or a part thereof, may serve as the source of energy of the emergency gear.

The emergency set must have a minimum range of 80 nautical miles for vessels of 6,000 tons and upward; or for those of smaller tonnage, partly or solely engaged in long distance passenger service; of 50 nautical miles for vessels of 1,500-6,000 tons which do not come under the above-mentioned category; of 30 nautical miles for vessels of less than 1,500 tons.

When the emergency set includes an induction coil it must be possible to utilise it: (a) for transmitting by direct excitation (plain aerial); (b) for the emission of syntonised and slightly damped waves obtained by feeding the condenser of the primary oscillating circuit of the principal set from the secondary of this coil.

The above apparatus must allow of a rapid change from one of these methods of transmission to the other.

All arrangements must be made so that the emergency set may be put into action instantaneously.

ART. 3.

Antennæ.

(a) *General Conditions.*—Antennæ must always be maintained in perfect condition, not only with regard to rigidity, but also with regard to electrical resistance.

All the connections of antennæ must be rigidly soldered with the greatest care. Soldering must be carried out with resin to the exclusion of all liquid which might act on metal.

Every precaution must be taken that no strain be put upon a soldered joint, or upon any part which has been heated.

The same precautions must be taken in the case of a broken connection.

Besides the principal antennæ which is in everyday use, there shall be carried on board a single-strand antenna in reserve as well as a small emergency antenna.

(b) *Principal Antenna.*—This must be of a multiple-stranded type strongly fixed.

This antenna must be furnished with straying guides suitably insulated, with their ends attached to the yards in order to avoid shifting under wind-strain or the motion of the ship.

(c) *Reserve Single Strand Antenna.*—In order to afford a temporary stopgap when the principal antenna has been badly damaged by bad weather and when circumstances render reconstruction impossible for some little while, and with the object of carrying on a makeshift radiotelegraphic service, every vessel must carry a single strand reserve antenna of a convenient shape and size. This antenna shall be stretched on a special support furnished with its own insulator—constructed of an unbreakable and elastic material like rubber or caoutchouc rope—and placed in the wireless cabin ready for the operator's use.

The two masts intended to serve as support shall be furnished each with a reserve block fixed as high as possible and with a continuous halliard serving exclusively for the haulage of the single strand antenna. These blocks and gear for the spare set must always be maintained in perfect order.

(d) *Emergency Set.*—Experience has shown that the explosion of a torpedo or a mine fairly frequently entails the fall of a mast, and consequently tears down the antennæ at the same time, thus preventing the vessel from sending out wireless calls for aid.

In order to neutralise the consequences of such a mishap every ship must be furnished with a small emergency antenna *totally separate from the masts.*

This antenna must be multiple stranded with the object of ensuring a sufficient sending range. It may be of a prismatic or cylindrical type with four or six strands (of the pattern usually spoken of as "sausage"); it shall be fixed by the aid of blocks, say, on one side to the top of a funnel and on the other to the apex of a small spar attached to the wireless cabin or the wheel house, etc.

This antenna should be given as much extension, both from the point of view of capacity and height, as it is practically possible under the circumstances. In the neighbourhood of a funnel it would not be possible to use for its fixture either blocks, insulators or fastening material which might be affected by heat or

steam such as ropes, ebonite, rubber, etc.) This emergency antenna must be permanently fixed on the exterior to an insulator with a special lead-in of a type similar to the insulator of the main antenna. Every care must be taken to ensure the practicability of its being instantly connected with the apparatus for transmission and reception in the interior of the cabin.

(e) *Metal Stays.*—The metal stays of masts and other gear, arranged more or less parallel and at short distance from the strands of the antenna, must be effectively broken by insulators of high mechanical strength in such a way as to avoid any appreciable absorption of energy.

(f) *Tension of Antenna Stays.*—Care should be taken against stretching the stays too tightly so as to avoid antennæ being torn away in consequence of severe vibrations of the mast head caused by explosion, collision, etc.

ART. 4.

Electric Generating Group.

Every electric generating group must be constructed and arranged so as to maintain continuous service.

(a) *Ship's Regular Generators.*—If there be machinery on board for lighting the ship, etc., it can equally well serve for supplying energy to the wireless station, provided that when all the apparatus for which it is normally employed is being served there remains an ample supply of electric power for working the radiotelegraphic installation.

(b) *Special System.*—For this purpose it is necessary to choose a very rigid system of construction which is not liable to derangement by powerful shocks and which can be quickly connected up. No systems of electro generation shall be allowed which do not possess a minimum power of $2\frac{1}{2}$ kw. with compound excitation on the dynamo, machines of less power not being of the requisite robust qualities. A power of $2\frac{1}{2}$ kw. must be exclusively reserved to the wireless station and contingently to the lighting of the wireless cabin. In the interests of the safety of the ship the electric generating group must be placed as far as possible in the upper part of the machinery room, or, if it consists of an internal combustion motor, in the immediate neighbourhood of the wireless telegraph station, but so situated that working does not interfere with the operator.

(c) *Working.*—The electric generating system shall work continuously throughout the voyage and the current must be always at the disposal of the operator.

In every gang of engineers one of them must be specially told off to conduct and maintain the electric generating system, and this duty must not in any case fall upon the operators.

(d) *Voltmeter.*—The switchboard belonging to the electric generating system must include an absolutely reliable voltmeter and ammeter.

ART. 5.

Location of the Wireless Telegraph Station—Cabin.

(a) *Location.*—The wireless station must be installed whenever possible on the upper bridge, not too much towards the stern of the ship because the revolutions of the screw produce vibrations which hinder the reception of feeble signals. As far as possible a location shall be chosen free of smoke-stacks, chains, metallic fittings and, as far as possible, out of reach of the waves.

(b) *Cabin*.—This must be solid and well built, perfectly watertight and of a sufficient size to comfortably contain the apparatus, and to serve in case of need as quarters for the operators, besides being sufficiently sound-proof to allow of the reception of faint signals.

The motor alternator system of the sending station must be enclosed in a cupboard sufficiently sound-proof to prevent the noise made by its revolutions interfering with reception; the latter ought to be possible without involving any stoppage of the generating machine.

It is advisable to quarter the operating staff in the wireless cabin. This arrangement allows of the most rapid action in the case of mishap and consequently affords greater security.

If circumstances do not permit operators to have their bunks made up in the wireless cabin, choice shall be made for their location in a position as near as possible to the wireless station and on one of the upper decks.

The cabin must be fitted with an emergency lighting system, independent of the ship's electric generating set, petrol lamps, candles, etc. The operator must always have ready to hand means for getting a light. A ship's lantern must be at the disposal of the operator in the wireless cabin, so that in case of need he may proceed during the night to overhaul the exterior apparatus.

Arrangements should be made that no light can, during the night, filter through to the outside, when the doors of the wireless cabin are opened. (Thick black curtains should be used or automatic light stoppers, operating as soon as the doors are opened.)

The wireless cabin shall be fitted with a ship's chronometer which must always show Greenwich meantime. (G.M.T.)

Easy and rapid access to the roof of the wireless cabin must be provided by an iron ladder so as to enable ready verification of antenna connections, lead-in insulators, etc.

It has been observed that submarines when bombarding a vessel generally endeavour to destroy the wireless cabin at the first opportunity. These cabins are conspicuous on account of the outline formed by the insulators leading down from the antenna. It will be found an excellent precaution to hide these insulators by (e.g.) awnings which follow the contour of the cabin and overlap its roof.

(c) *Means of Communication*.—The operator must not leave the wireless cabin and abandon his listening-in, in order to receive a communication from the officer on watch, or in order to hand to him a message which he has received, or to ask for current, etc.

It is equally necessary that a third party shall not intervene in the transmission of these messages, such a course being always liable to lead to dangerous errors.

A telephone or speaking tube must therefore be erected between the wireless cabin and the bridge.

If the operators have their bunks fitted in a place apart from the wireless cabin, an electric bell shall be installed in their state room with a push in the wireless cabin, so as to give the radiotelegraphist on duty an opportunity of summoning his colleague.

If there be only a single operator, and if he sleeps in a separate cabin, an electric bell shall be installed in that cabin with a push on the bridge, so as to give the officer on watch means for calling the operator when the latter is not on duty.

All these means of communication must invariably be kept in perfect working order.

ART. 6.

Technical Conditions of Installation.

(a) *Erection and Fitting*.—The rapid execution of erection under present conditions must not interfere with the elementary precautions of assuring the efficient working of the wireless station and providing against risks of short-circuiting and fire.

The connections must also be carefully made by means of a flexible cable insulated by two layers of vulcanised rubber, the whole covered with lead, with an insulation resistance of at least 600 megohms per kilometre. This cable shall moreover be mechanically protected by a tube of iron or steel in every part where it is exposed to deteriorating influences.

A special line leading from the switchboard of the electric generating group shall furnish power to the wireless station. No other circuit must be connected up with this line except, in cases of emergency, a lighting circuit for the wireless cabin. Fuses must in this case be inserted in order to protect the lamp or lamps. A bi-polar interrupter and contact-breaker must be placed:

(a) In the machine-room, on the switchboard of the electric system in the special circuit serving the wireless station.

(b) Within the wireless station itself in the circuit carrying the continuous current.

(c) Within the wireless cabin in the alternating current circuit at the ends of the alternator.

In the case of the two contact-breakers placed in the continuous feed circuit, the one on the switchboard of the electric generating system, and the other in the wireless cabin, the former must be considerably stronger than the latter in order to avoid its replacement with fusible material when faulty manipulation (or some accident to the wireless instruments) results in the melting of the fuses in the wireless cabin.

The switchboard of the wireless station shall be fitted with the necessary measuring instruments for observing the working of the machines and the wireless apparatus.

Nevertheless, it is permissible to replace continuous and alternating current voltmeters on this switchboard by pilot lamps of appropriate voltage.

The continuous current voltmeter—or the pilot lamp which takes its place—must give the operator constant opportunity for assuring himself that the generator is in working order and that there is no interruption in the circuit which feeds the wireless station.

(b) *Machines—Low Frequency Circuit*.—These machines and this apparatus must be very carefully insulated between the windings and between the windings and the frame. They must be submitted to a test for dielectric strength under a continuous voltage of 1,000 volts applied for five minutes when cold.

(c) *High Tension Apparatus*.—The insulation must have and must preserve a high degree of efficiency. This apparatus must be able to stand the following test: The sending station must be operated with the antenna circuit disconnected, and with each terminal of the secondary of the transformer earthed in turn for a period of five minutes, together with its core and metallic casing. Both machines and instruments must be effectively protected against any excess of strain due to the high frequency circuits.

(d) *Accumulator Batteries*.—It is strictly forbidden to switch any circuit whatsoever—lighting, ventilating, etc., on to the accumulator

batteries of the principal set, or on to the battery of the emergency set, or to transfer any units of the battery elsewhere; these must never be used, for instance, for lighting purposes during a temporary stoppage, etc.

The only allowable exception consists of the connecting on to the battery of the principal set—if such a source of supply be utilised for that set—a pilot lamp of 20 watts at the maximum which takes the place of a volt meter. Any such lamp must be protected by a special double-pole fuse.

No pilot lamp may under any circumstances be fitted on the battery of the emergency set.

Operators are held personally responsible for any misuse of their batteries.

The batteries of accumulators must always be kept completely charged during the voyage. This complete charging must be effected before departure, and if necessity arises they must be re-charged every day, or every other day, according to the amount of use that has been made of them.

The accumulator switchboard must include:

(a) An ammeter showing the strength of the charging and discharging currents.

(b) A well-calibrated voltmeter connected to the terminals of the battery.

So far as the battery of the emergency set is concerned it is always permissible to omit the ammeter when the charging current is automatically limited to one or two values, determined by the introduction of fixed resistances in the circuit.

Since the battery of the emergency set is very seldom at work care must be taken to ensure its maintenance in good order.

For this purpose a special apparatus must be provided for discharging the battery through a resistance.

This discharge shall be carried out at Ports of Call, and care must be taken immediately afterwards to re-charge the battery completely.

Steps shall be taken to make sure of the preservation in good order of the batteries during the periods when the ship's dynamo has stopped working.

(e) *Syntonsisation.*—Regulations against sending out signals in the larger number of allied ports and in certain neutral ports plainly renders difficult a proper tuning up of the ship's station after installation.

Nevertheless, it is easy to effect an approximate syntonsisation without infringing the above-mentioned regulations by simply exciting the aerial with the help of a suitable buzzer. It is, therefore, formally recommended that this buzzer tuning method shall be used after installation, preparatory to the operation being completed after the ship has left the port. The operator will be guided in these tests by the reading of his antenna ammeter.

This syntonsisation must be made for each of the two regular wavelengths (300 and 600 metres) and for each of the three antennæ, the regular, the single strand, and the emergency.

Tables clearly indicating the different tuning adjustments must be posted up in the cabin in clear view of the operator.

(f) *Plans of the Connections.*—Working Arrangements.—Amongst the documents carried by the station, there must be included detailed plans of the connections of the installations and of all the apparatus, with the object of helping operators in looking for and rectifying any faults that may occur.

Radiotelegraphists must thoroughly understand the working of their station. They must

practice themselves in establishing instantly, and without experimentalisation the necessary connections for bringing into action the emergency set, the emergency aerial, different wavelengths, etc.

ART. 7.

Operating Personnel.

(a) *Nationality.*—The Belgian Government established on the 4th May, 1917, the following regulations concerning the nationality of the operating staff:—

(1) The radiotelegraphic stations of Belgian ships must be served, in principle, by operators of Belgian nationality.

(2) In default of Belgian operators the owner of stations may, at their own responsibility, and with the previous authorisation of the Belgian Government, have recourse to subjects of Allied nationality to the exclusion of neutral subjects, until they have been able, with as little delay as possible, to replace them by Belgian subjects.

(3) It is only quite exceptional that a neutral operator will, under any circumstances, be allowed to fill a post on board. A specific request must be made in advance, if need be, by telegram, and the owner of the station must furnish detailed references. He will be held responsible for any acts that may be committed by this employé.

In any case, any such authorisation will be valid solely for a single trip.

Demands for emergency authorisation must, if need arise, be addressed to: The Administrator of Belgian State Telegraphs, Radiotelegraphic Service, 15, Place de l'Hotel-de-Ville, Le Havre, France. The telegraphic address of which is: Service Radiotelegraphique Etat Belge, Le Havre.

(b) *Qualification.*—Every operator, whatever may be his nationality, in service on board Belgian ships must possess the Belgian Radiotelegraphic operating licence of the first class, and have a good working knowledge of English.

(c) *Physical Qualifications.*—The special character of the service in times of war constitutes a complete bar against the employment of any operator not completely robust, or in full possession of all his limbs, or in fine anyone who is not physically perfect.

(d) *Disciplinary Measures.*—If an operator gives cause for any reasonable complaint on the part of the Belgian, or Allied Authorities, on the part of the owner of the ship, of the captain, of the owner of the station, etc., with regard to any misdemeanours committed in the course of the execution of his service, he may be disqualified, either temporarily or for the duration of the war, his licence being suspended for the period of his disqualification. A notice thereof will be sent to the Minister of the Interior if the individual so affected proceeds to appeal. If he has been suspended without pay from his functions as Radiotelegraphist on board Belgian ships he will immediately be placed at the disposal of the military authorities.

Operators are, moreover, subject to the Disciplinary and Penal Code of the Mercantile Marine.

ART. 8.

Organisation of the Service.

(a) *Listening-in.*—During the whole length of the voyage listening-in must be completely continuous. This can only be assured by relays of two operators in watches of four hours on and four hours off. The operator on watch

may not even temporarily quit his post in case of urgent need without having been replaced by his colleague not on duty. Nevertheless, if the supply of qualified operators belonging to Belgian, or Allied nations shall be temporarily insufficient, the owner of the ship may be exceptionally authorised to have the service carried on by a single operator. This latter must in that case so organise his listening-in as to receive all the war warnings which may affect the navigation of the ship, as well as radiotelegraphic time-signals at least once in the 24 hours.

Such an authorisation as this must be applied for to the Department of Railways, Marine, Posts and Telegraphs. The person so applying must state the probable period which will elapse before he can recruit or train a second operator.

(b) *Carrying out of the Service.*—For the carrying out of the Radiotelegraphic Service operators are placed under the supreme authority of the commander of the vessel.

They are strictly forbidden to send out signals of any sort, or to answer a signal, even one of distress, without the authorisation or instructions of the officer on watch. They must never answer any station utilising the Telefunken System. No Allied vessel possesses a set of this type.

All transmission—obviously cases of distress excepted—must be made with the smallest amount of power compatible with the circumstances, so as to reduce as far as possible the zone in which the signals may be picked up by enemy sets, thus enabling them to determine the position of the ship.

All executive messages relating to navigation, as well as all distress signals, must be brought with all speed to the knowledge of the officer on watch *exactly as they stand*; the operator must never undertake to judge whether a message of this kind does, or does not, affect the navigation of his ship, the commander alone is the arbiter in such a matter.

Itinerary.—The operator on watch must make himself acquainted with the itinerary, the position and the course of the ship.

(c) *Duty in case of Distress.*—In the case of accident, explosion, etc., the operator, or operators, must immediately test their instruments to see if they are still in good working order. If the current of the ship's generator has failed they must switch on, without loss of time, the connections of the emergency set and test their antennæ. If the principal antenna be out of order, and if time presses, they must link up their gear with the emergency antenna, taking care to free it, whenever necessary, from all metal contact which may earth it, or from the principal antenna.

A trial with the auxiliary coil with direct excitation (plain aerial) will immediately inform the operator with regard to the quality and insulation of the antennæ.

In a word, he must act in accordance with circumstances, so as to be able to send out his signal with the smallest possible delay; the gain of a few seconds may save the lives of all the passengers. It is only if the captain considers that sufficient time is available, and if the emergency antenna be not in sufficiently good order, that the operator may proceed to repair the principal antenna, switch on the single strand antenna, or even erect a make-shift antenna.

As soon as a set is ready to send, he must advise the captain and ask for orders, getting them *confirmed in writing*, and these order must be followed exactly.

It is the paramount duty of the radiotelegraphist not to abandon his post so long as there is any possibility of sending or receiving; unless the commander has given him the order to do so in view of the imminent abandonment of the ship.

(d) At sea the operator must be ready at any moment to send out signals of distress with the smallest possible delay and with the maximum of energy and efficiency that the circumstances permit; he will make his arrangements accordingly. Thus for instance in the event of damage being done to the aboard-ship generator or to the principal set the emergency gear must be put into working operation.

No distress call may be radiated without the express order of the commander of the ship. It is absolutely necessary that the operator should remain collected at the critical moment of action, mishap or an attack. Upon him may depend the lives of all the passengers to say nothing of his own as well as the preservation of the ship and its freight.

He must never lose sight of the fact that it is useless to send out a distress signal without its being accompanied by the name of the ship in full and as exact an indication as possible of its position. The form of the distress call must follow strictly the instructions of the Naval Authorities in charge of all commercial ships.

Every positional error or change of position must also be radiated.

If an operator receives no answer to his distress calls he must repeat them with intervals of listening-in, and on each emission must recapitulate all the needful particulars. Should the operator conclude that his appeals are vain he should send out a new series of calls after having proceeded in the following manner. Considerably amplify the coupling between the primary oscillation circuit and that of the antenna so as to obtain an impure badly tuned and more damped emission, which stands the chance of affecting the reception of a larger number of stations and consequently of being picked up. It must be remembered, however, that the range of such an emission is less than that of a properly syntonised call. Recourse may also be had on occasions to the emergency gear with induction coil acting on a plain aerial.

Ship's Register.

(e) On every ship the operators should keep a register with numbered pages in which they will progressively enter the following particulars—showing the time in G.M.T. and the name of the operator on watch:—

(1) The start and finish of the watch of each operator as well as any interruptions, their duration and their cause.

(2) Any faults which may occur in the transmitting or reception gear, any lack of current, etc.

The nature and the cause of these mishaps must figure in the report, as well as the duration of the resulting interruption.

(3) The result of the periodic experiments conducted or some mention of the reason for which they have not been made.

(4) A record of all communications carried on with foreign stations and which did not affect their own ship.

It will suffice to make a simple record which will allow later on of these communications being reconstituted and identified. For example:—

17^h. 53 ABC de XYZ—27 mots code mqzr dvy... .

17 h. 56 XYZ demande repetition depuis hdpz, etc., etc.

(5) The complete text of all messages received regarding the navigation of the ship and communicated to the officer on watch.

(6) All distress calls picked up.

(7) The exact text of every message sent.

(8) If possible and if stations permit, in the case of accidents enter all details relative to the execution of the radiotelegraphic service (distress calls, replies, steps taken for safety, etc.)

An operator is forbidden to enter in the steamship register any translation into plain language of a coded text. His register must, moreover, be verified and checked every day by the commander of the ship.

This register being by its nature essentially confidential must only be handed over to the Belgian and Allied authorities.

In the event of disaster operators must endeavour to save their ship's register, and if there be any risk of its falling into enemy hands they must throw it into the sea.

Account of Accident.

(f) In the event of its being necessary to abandon ship, or if the operator or operators are able to preserve their steamship register, they must address it to the Administration of Belgian telegraphs at Havre through the intermediary of a Belgian Consul residing in the neighbourhood of the port at which they are disembarked. This register must not be sent by post. Whether the register has been sent or not, the operator (or operators) must in addition indite with as little delay as possible a report giving, with specific mention of dates and times, every detail relating to the execution of the radiotelegraphic service both before and after the accident (distress calls, life-saving procedure, etc.).

Mention must be made of what has happened to the ship's register, and it circumstances permit this report must be submitted by the operator, or operators, to the captain for his signature and he will make thereon any observations which he thinks fit. This document shall then be addressed by registered post to: l'Administration des Télégraphes belges Ministères belges, Le Havre (France).

Allocation of Operators.

(g) In the interest of the security of navigation it is well to maintain as far as possible the allocation of an operator to a specific ship or at all events to ships which ply under the same conditions, i.e., between the same ports or countries.

Regard may be had for the purpose of this rule to temperaments in certain cases; for instance, it is advisable to consider the necessity of relieving operators navigating in tropic seas after long enforced idleness of a ship, or after illness, accident, leave, etc.

Confidential Character of Wireless Messages.

(h) Every operator must have taken the oath of observing the most absolute secrecy with regard to wireless communication under the penalty of Articles 149 and 150 of the Belgian Penal Code.

The attention of operators is expressly directed to the point that in time of war any detail relating to the radiotelegraphic service is of a character essentially confidential; every indication relative to the manner of framing and transmitting certain messages, to the presence of certain ships, to the routes

followed, to convoys and their escorts, to distress calls, to sinking, etc., in fine everything which concerns navigation, must remain absolutely secret.

Every indiscretion coming to the ears of the enemy may have the most serious consequences.

The utmost discretion is therefore necessary, and more particularly in neutral countries and in the presence of neutral subjects—including amongst them their wireless men.

ART. 9.

Maintenance and Investigation.

Operators are responsible for the maintenance of radiotelegraphic installations. The commander of the ship must accord them the help of the personnel on board necessary for the investigation and upkeep of antennæ apparatus, etc.

Every part of the radiotelegraphic installation must be constantly maintained in perfect order, special care being given where such parts are subject to high tension.

Periodic Tests.

(1) Twice a day, morning and evening, a test shall be carried out of the principal transmitting set and of the emergency set in local circuit; that is to say, the antenna being disconnected. This test (signals or continuous sending) shall last for the length of time which the operator judges necessary to make sure that all is in order.

(2) Every unnecessary message is forbidden on the high seas. In order to make certain of the satisfactory working of the station (including radiation and insulation of antennæ) opportunity shall be taken at the moment of starting the voyage for proceeding rapidly and at irregular intervals to the following emission tests.

Choice must be made of a time when the traffic between neighbouring stations is small and care must be taken not to choose the hours when war warnings are being issued. These tests shall be reduced in duration to the minimum. They shall proceed as follows:

(a) With the principal set on the principal antenna send out a call of a few seconds; the deviation of the amperemeter of the antenna will allow an operator to judge immediately if the installation be working well (it is unnecessary to keep up this sending until the needle of the apparatus becomes absolutely motionless). (b) With the coil of the emergency set excite the principal antenna in plain aerial; a long white spark strong and crackling will indicate that the insulation of the antenna is good, the emission of short sending will suffice. (c) Make the same test to verify the insulation of the emergency set.

(3) Make a daily verification of the spare detector.

In case of any parts of a machine or apparatus being found to be out of order take steps to remedy this at once. Never leave it over for later on.

ART. 10.

Special Material—Gear.

(a) *Spare Material.*—The Radiotelegraphic Station must contain the following material:—

(1) A complete transmitting condenser (primary circuit) of a fixed capacity and ready for service.

(2) An aerial lead-in insulator (or a spare tube).

(3) Antenna wire, insulators and accessories in sufficient quantity for the construction of a new main antenna.

(4) A telephone with double headgear and two leads.

(5) A galvanometer for the testing of circuits.

(6) Various wires and ropes.

(7) Various accessories and spare parts, etc.

(b) *Gear and Tools.*—The operators must have at their disposal an ample supply of tools especially such as are necessary for soldering antennæ and apparatus; their tool chest must contain *inter alia* a hydrometer for verifying the density of the accumulator electrolyte, and a portable and accurate voltmeter graduated from zero to 3 or 4 volts in order to measure the individual cell voltages.

ART. II.

Special Arrangements.

On board ships coming under this category absolutely special precautions must be carried out.

The wireless cabin must *de rigueur* be located on the upper deck and built in such a way as to be distinct and airy; the insulation of the antennæ and of the metallic stays must, moreover, receive special attention.

Supplementary precautions may be imposed in accordance with circumstances.

ART. I2.

Various Arrangements.

Modifications to Installations.—Ship installations must not be modified without the previous assent of the Department of Railways, Marine Posts and Telegraphs.

Nevertheless, in case of partial (or total) incapacity for working, a new installation may be temporarily erected, provided that it conforms with the conditions imposed for the authorised station.

A new request for authorisation must be sent in without delay, wherein shall be set forth the necessity for having carried out any modification of the installations approved.

The licensee of a board-ship station (*i.e.*, the holder of an authorisation to install, or of a sea-going radio licence) is obliged at all times to follow the instructions given by the Department of Railways, Marine, Posts and Telegraphs, in whose control are vested all ships' stations, and to carry out within the specified times all modifications or additions which are judged necessary, not only with regard to installations and apparatus but also with regard to the manning, qualification and service of the operating personnel.

At need, the Department above mentioned shall carry out, or cause to be carried out, at the expense of the owner, all testing, repair, modification, or addition of which the execution is judged necessary to ensure good working of the installations or the safety of the ship, without any responsibility under this heading being incurred by the State.

Lifebelts.—The wireless cabin, whether or no it serves as the operators' state room, must contain for each of the radiotelegraphists a lifebelt of an efficient and approved type.

Other life-saving apparatus of the same character shall be at the disposal of operators in the places in which they are located if they do not sleep in the wireless cabin.

These life-saving appliances must be always kept in perfect order.

ART. I3.

Measures of Discipline and Control.—The officials of the Belgian Government duly

appointed for that purpose have, at all times of the day or night, not only in Belgian territorial waters, but outside those waters, as well as on board Belgian vessels in foreign ports, free access to the installations of the authorised ship station and free disposal of the documents relating to the service of that station.

The owner (that is to say, the holder of an authorisation for installation or of a radio-telegraphic licence) as well as his representative, employees, charterers, captains, officers, operators, masters and personnel are bound to facilitate by every means the work of supervision and control vested in these officials.

Under its controlling rights, the Department of Railways, Marine, Posts and Telegraphs may demand that the wireless register of the ship be forwarded to it.

Access to the Wireless Cabin.—Access to the wireless cabin is strictly forbidden to the personnel of the ship, except in such cases where access is necessary for the purposes of duty; and the same interdiction applies to any foreigner with the exception of the authorised naval authorities of Allied Powers.

In the absence of the radio officers, the cabin must be locked up after the windows have been closed on the inside, the key shall be handed to the commander of the ship or, in his absence, to the chief officer.

INFORMATION TO BE FURNISHED IN THE REQUESTS FOR AUTHORISATION APPERTAINING TO RADIOTELEGRAPHIC STATIONS.

ART. I4.

Applications to be sent, under registered cover, to the Minister of Belgian Railways, Marine, Posts and Telegraphs, at Sainte-Adresse, Seine-Inférieure, France.

(a) *Where a Ship is not already furnished with Wireless.*—

Application.—Social status, name, Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (steamer, sailing vessel, motor launch), net tonnage, speed, business, itinerary, whether carrying passengers regularly or occasionally; whether on occasion freighted with volatile and inflammable goods.

System of Apparatus.—What system of apparatus do you purpose installing on board your ship? Name and address of the supplier of the installation and apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Here give a description of the various parts and arrangements of the proposed installation, with plans or the connections and apparatus.

[N.B.—Descriptions and plans must be of such a character as to indicate whether the proposed installations conform to the prescribed conditions.]

The power available at the terminals of the wireless alternator (voltage and current); frequency of current.

Number of sparks per second.

Minimum range by day of the stations as estimated by the supplier.

Constitution of the emergency set.

Accumulator battery of the emergency set, number of cells, type, voltage, capacity, in ampere-hours.

Does the sending set include a battery of accumulators?

Number of cells, voltage capacity in ampere-hours.

Antennæ.—The form and approximate dimensions of the main antenna. How is it proposed

to install the emergency antenna? Where will it be fixed? Its shape and approximate dimensions.

Electric Generating System.—If an electric generating system exists on board, show what kind of motor it carries (steam, petrol, etc.).

Power, voltage, and method of excitation for the dynamo.

The power available for feeding the wireless station.

Where is this electric generating system located?

If it is necessary to install a special electric generating system:—

Name and address of the firm which supply it.

A description and plan of the system, type of motor (steam, petrol, etc.).

Power, voltage and method of exciting the dynamo.

Erection of the Station.—Where is it planned to install:—

(a) The wireless cabin (are you constructing a special cabin or are you adapting one already existing)? On what deck? In what place? (Here add a plan and elevation.)

(b) The accumulator battery.

(c) The electric generating system (if a separate system is necessary).

(d) Operators' quarters.

Operating Personnel.—What qualified persons have you available to work your station?

Time for Erection.—How long a period do your suppliers need for the delivery of the material and for installing it on board your vessel?

About what time and in what port will this installation be set up?

The Proposed Signalling Arrangements.—Call letters—normal range in nautical miles. Wireless system and the character of emission. Wavelengths. Nature of services. Hours of service.

Board-ship charges: per word in francs.

Board-ship charges: minimum per radiotelegram in francs.

(b) Where a vessel is already furnished with a wireless station that requires modification or completion in conformity with the stipulations of the present regulation.

Applicant.—Social status, name and Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (whether steamer, sailing boat or motor-launch), net tonnage, speed, nature of traffic, itinerary; whether it regularly or occasionally carries passengers; whether on occasion freighted with volatile and inflammable articles.

System of Apparatus.—What is the system of apparatus installed on board your ship? Name and address of the supplier and of the installer of this apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Add a description of the various parts and make-up of the existing installation with a plan of its connections and apparatus.

What are the modifications you propose introducing to put it in accord with the conditions of the present regulation?

[N.B.—Descriptions and plans must allow of its being seen whether the installation and proposed modifications are in conformity with the new conditions laid down.]

Power available at the terminals of the alternator (voltage and current); frequency of the current.

Number of sparks per second.

Minimum range by day of the existing station.

Is there an emergency set? What is its constitution?

The accumulator battery of the emergency set, the number of cells, type, voltage, and capacity in ampere-hours.

Does the principal set include an accumulator battery?

Number of cells, type, voltage, and capacity in ampere-hours.

Antennæ.—Form and dimensions of the principal antenna.

How is it proposed to install the emergency antenna?

Where will it be fixed? The form and approximate dimensions thereof.

Electric Generating System.—What sort of motor does it carry (steam, petrol, etc.).

Power, voltage and method of exciting the dynamo.

What is the power available for feeding the wireless installation?

Is the electric generating set installed to serve solely the wireless station? Or is it to supply the lighting of the ship, electric motor-pumps, ventilators, etc.?

Where is the electric generating system installed? On what deck?

Location of the Station.—Where is it proposed to install:

(a) The wireless cabin; on what deck? at what point? (Include here diagrams in plan and elevation.)

(b) The accumulator battery of the emergency set, as well as that of the principal transmitting set (if it carries one)?

(c) Operators' quarters?

Operating Staff.—What qualified persons have you at your disposal for working the station?

If you have on board only a single Belgian operator, how soon can you arrange to have the station worked by a second Belgian radiotelegraphist, or provisionally by one of Allied nationality?

Time Occupied by the Modifications.—How long do you estimate your suppliers and workers will take in modifying and completing your installations to accord with the conditions of this new regulation?

About what date and in what port will these modifications probably be carried out?

F APPLICATION OF THE DECREE OF THE 10TH SEPTEMBER, 1918, RELATIVE TO SHIPS' LICENCES. CIRCULAR NO. I.

The attention of shipowners is directed to the fact that in pursuance of Article V of the Decree of the 10th September, 1918, relating to shipping licences, Belgian vessels of 1,500 tons or over must be fitted with a radiotelegraphic station for the transmission and reception of ether messages through the agency of a competent personnel. The erection of these stations, their constitution, their operation, their supervision, etc., are regulated by international agreements and by Belgian laws and regulations in matters of radiotelegraphy.

With as little delay as possible, and at latest before the 15th November, 1918, every owner of a vessel liable to the above-mentioned obligation must, in conformity with Article I of the Royal Decree of November, 1913, deposit under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs of the Belgian State, located at Sainte-Adresse, Seine Inferieure, France, a request for authorisation to install a radiotelegraphic station.

ONE SEPARATE REQUEST MUST BE MADE FOR EACH VESSEL.

Directions with regard to the particulars necessary to be furnished in such requests for authorisation will be found at the close of the administrative regulations affecting wireless telegraphy, dated 15th October, 1918.

The Department of Railways, Marine, Posts and Telegraphs, having regard to national interests and to the arrangements concerning apparatus and operators, shall settle the order in which vessels shall be fitted with their radiotelegraphic station and shall assign to each one of them the date at which it shall be completely installed and in a perfect condition for working.

The attention of shipowners is specially directed to the conditions of Articles 1 and 2, of the Royal Decree of the 3rd November, 1919 which will be very strictly enforced. The authorisation for making installations must be obtained before any measure can be taken by the interested parties with the object of initiating the work.

A radiotelegraphic licence shall be granted to the owner of a vessel when the installations have been recognised as conforming to the conditions imposed. This licence will be granted for one or several voyages, or for a certain fixed period. It will be cancelled if it be established at any moment that the installations have not been set up and worked in accordance with the conditions stipulated in the licence or in a later regulation.

The licensee (one who benefits under an authorisation for a wireless installation or of a radiotelegraphic licence) shall be bound at all times to follow the instructions given him by the Department of Railways, Marine, Posts and Telegraphs, and must carry out within the specified period all modifications or additions which are judged necessary, both with regard to installations and apparatus, so far as concerns its material, and the qualification and services of the operating staff.

Whenever needful the above-mentioned Department shall initiate, or shall cause to be initiated, at the cost of the licensee, any verification, repair, modification or addition which may be judged necessary to ensure the satisfactory working of the installations or the security of the ship without involving any responsibility therefore on the part of the State.

Except with special permission previously obtained, board-ship stations must be worked by specialised operators of Belgian nationality. Telegraph Administration.

No. 1665 R.

Dated at Havre, 21st October, 1918.

CIRCULAR LETTER TO SHIPOWNERS WHOSE VESSELS ARE ALREADY FITTED WITH A RADIOTELEGRAPHIC STATION.

GENTLEMEN.—Article V of the Decree of the 10th September, 1918, relating to ships' licences makes the granting of these permits subject to certain conditions affecting the manning and conditioning of the ship.

The Circular No. 1 addressed to shipowners has brought to your notice that, in conformity with Article V above, every Belgian seagoing vessel above 1,500 tons net must be fitted with a radiotelegraphic station in charge of a competent staff.

You will have found annexed to the Circular in question the text of certain arrangements which regulate the erection, working and conduct of the stations.

The Decree shall come into force on the 15th October, 1918. A certain amount of delay will be allowed you for modifying the radiotelegraphic installations already in existence on board Belgian vessels and to complete the engagement of the operating staff in accordance with the stipulations of the Belgian administrative regulations with regard to radiotelegraphy under date of the 15th October, 1918.

On the expiry of these delays all wireless authorisations or licences issued previously will expire and be cancelled.

Kingly forward with as little delay as possible and at latest by the 15th November, 1918, under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs, located at Sainte-Adresse, Seine inferieure, France, a fresh request for authorisation with regard to radiotelegraphy. *A separate request must be made for each ship.*

Directions as to particulars you are required to furnish in your request for authorisation will be found at the close of the Administrative Regulations dated 15th October, 1918.

After examining your request I will let you know the length of time granted you for installing and working your present station under the rules newly imposed.

A fresh radiotelegraphic licence will be granted to the ship as soon as we have verified that these conditions are fulfilled.

In order to guard against mistakes and loss of time, all correspondence relating to radiotelegraphic installations (requests for particulars, personnel, licenses, etc.) must be addressed directly to:—

Service de Radiotélégraphie de l'Etat Belge
Administration des Télégraphes,
15, Place de l'Hôtel de Ville,
LE HAVRE (France);

and telegrams to:

Service Radiotélégraphique Etat Belge
LE HAVRE (France).

Please acknowledge receipt of this letter.

Your obedient servant,
(Sgd.) Belgian Inspector-General of
Telegraphs for Minister of
Marine, Posts and Telegraphs.

MINISTERIAL DECREE REGARDING AMATEUR WIRELESS INSTALLATIONS.

THE MINISTER OF RAILWAY, MARINE, POSTS AND TELEGRAPHS.

DECREES:

G The conditions regulating the establishment and the working of receiving wireless stations are fixed in accordance with the following:—

ART. 1.—Requests for authorisation must be addressed to the Director-General of Telegraphs and Telephones at Brussels.

The person making the request must indicate the precise place and functions of the proposed station and must furnish for approval a description of the apparatus.

The applicant must prove if such should be the case that he is of Belgian nationality.

ART. 2.—Authorisation is granted:—

(a) By the Director-General of Telegraphs and Telephones when the applicant be of Belgian nationality.

(b) By the Minister of Railways, Marine, Posts and Telegraphs to whom the request should be transmitted by the Director-General with his advice, if the applicant be of foreign subject.

ART. 3.—The station authorised will be utilised exclusively for reception of time and weather signals; the transmission of any other electric signal is formally prohibited.

The use of amplifying valves is not allowed. However, the Administration of Telegraphs and Telephones may, in certain particular cases, which must be submitted for approval and after enquiry and examination of the reasons given by the applicant, grant an authorisation to use such apparatus under conditions to be determined by the Administration.

ART. 4.—Under the penalty of immediate withdrawal of the authorisation, the applicant must scrupulously observe, and cause others to so observe, the secrecy of any information which is not intended for public use.

The contents of radiotelegrams other than meteorological telegrams which will eventually be received by the Postal Authorities, must be neither written nor divulged to anyone outside the officials appointed by the Administration of Telegraphs and Telephones, or of the judicial authority. The withdrawal of the authorisation as a result of a contravention of this Law, will be eventually carried out without prejudice to the applicant of any punishment provided for by Law.

ART. 5.—The applicant is forbidden to receive any payment or remuneration whatsoever for the reception of information by means of the station authorised.

ART. 6.—The Government reserves to itself the right to examine installations authorised. When necessary the applicant will grant to the duly commissioned delegates of the Government free access to the said installations, and will facilitate by every means in his power such examination by the delegates.

ART. 7.—The applicant alone is responsible for all consequences whatsoever, resulting from the present authorisation, not only from the point of view of mistakes which may be made, but also in regard to all matters connected with patent rights or of any other rights of a third party. The responsibility of the State is, and will remain, entirely separate in connection with the present authorisation.

ART. 8.—The applicant is held responsible for notifying the Director-General of Telegraphs and Telephones of all alterations which he proposes to make to his apparatus. This must not be changed without the previously obtained consent of the Administration of Telegraphs and Telephones.

This administration may, however, at any time, and for whatever cause, suspend or revoke the authorisations granted, without the payment of any indemnity whatsoever, or without giving any reason for such suspension or revocation.

This permission neither includes any privilege either for this particular authorisation or for any subsequent authorisation of the same nature.

It is not transferable without the express permission in writing of the Administration of Telegraphs and Telephones.

At the request of the Administration of Telegraphs and Telephones the applicant must immediately place his apparatus out of working order.

ART. 9.—The applicant must hold himself responsible for all expenses and charges whatsoever, occasioned by permission granted to him.

ART. 10.—The applicant will pay a fixed annual fee of 20 francs for every authorised receiving station.

The first payment will be made before obtaining the authorisation; it will cover the remainder of any year from the day of the authorisation to the following December 31st.

Subsequent fees will be paid during the month of January of each year. No refund will be made by the Treasury no matter for what reason the use of the apparatus previously authorised be discontinued.

This applies equally in the case of the station being discontinued by order of the Administration of Telegraphs and Telephones.

ART. 11.—Stamp Duties and subsequent Registration Fees will be charged to the applicant.

Done at Brussels, August 7th, 1920.

(Signed) P. POULLET,
The Minister.

The Administration of Telegraphs and Telephones will generally allow the use of amplifying valves and the reception of radio concerts. The regulations regarding broadcasting are now under consideration.

Extracts from Royal Decree of November 8th, 1920, relating to regulations for ships.

(a) Provisional licence for radiotelegraphic operation on board ship.

Administration of Telegraphs and Telephones.
Radiotelegraphic and Radiotelephonic Service.
No. 2886 /R.

Provisional licence for radiotelegraphist operator on board ship.

The present provisional licence for radiotelegraphist on board ship of the first class has been delivered to

M. born at the of Belgian nationality.

The recipient has been subjected to a practical examination in audible transmission and reception at a speed of 20 words per minute.

M. has taken the oath relative to the secrecy of radiotelegraphic correspondence prescribed by the international regulations.

THE PRESENT PROVISIONAL LICENCE IS ONLY VALID UNTIL DECEMBER 21ST, 1920, TWENTY-ONE AND LATER.

Made in duplicate at Brussels, the 1921.

The Engineer-in-Charge of the Radiotelegraphic and Radiotelephonic Service.
The Chief of Floating Stations.

Signature of holder of the licence.

(b) Notice of authorisation.

Administration of Telegraphs and Telephones.
No. M. 192

By your letter of the you have solicited the authorisation to establish a private wireless station for the purpose of at

I have the honour to inform you that the desired authorisation has been accorded you under the conditions of the ministerial law of August 7th, 1920, of which the text is sent to you herewith.

The annual tax of 20 francs must be settled by cheque or postal order to the order of the Central Telegraph Department, Brussels. This order can be paid at any post office (excepting agencies), or to any rural postman on rounds. It is recommended that the following should be written legibly on the order:—

1. The number of the account to which the order is payable.
2. The name of the sender.
3. The nature of the payment (tax for wireless station.)

Yours faithfully,
The Director General.

BERMUDAS (THE)

(See Maps 35 and 46.)

A BRITISH Colony with representative Government, consisting of a group of 360 small islands (about 20 inhabited).

ADMINISTRATION.

There are two wireless stations working in the Colony. Wireless telegraphy is administered under the following enactments:—

A—The Wireless Telegraph Act, 1903.

B—The Wireless Telegraph Act, 1909.

THE WIRELESS TELEGRAPH ACT, 1903.

A From and after the passing of this Act it shall not be lawful for any person in these islands to transmit or receive messages across the seas (by an Act of 1910 this was amended by the addition of the words "or between places in these islands") by means of any wireless telegraph, or to install, erect, construct, establish, or maintain in these islands any instrument, apparatus, or other thing for the purpose of transmitting or receiving such messages, unless such person shall hold a written licence from the Governor authorising the same, and such licence shall be in force and unrevoked; and any person who shall offend against the provisions of this enactment shall be liable, on summary conviction before any two justices, for a first offence to a penalty not exceeding £25, and for a second or subsequent offence to a penalty not exceeding £100.

2. Any licence issued by the Governor under this Act may at any time be revoked by him by a written notice given to the person to whom such licence was issued, or by the publication of such revocation in the *Gazette*, and after such revocation such person shall not be entitled to any privilege or protection by virtue of such licence.

3. Any licence under this Act may be issued subject to such conditions and restrictions as the Governor may from time to time consider desirable in the public interest.

4. If any Justice of the Peace shall be satisfied from the information on oath of any credible person that there is good reason to believe that any of the provisions of the first section of this Act have been or are being violated, he may issue a search-warrant to any constable or constables authorising and requiring him or them, with or without assistants, at any hour of the day or night to enter into, and go through and search, inspect and examine any premises where such violation is suspected to have been or to be committed for the purpose of ascertaining whether such violation has been or is being committed; and if, upon such search, any instrument, apparatus, or other thing apparently used, or capable of being used, for the purpose of transmitting or receiving messages across the sea by wireless telegraphy shall be found, it shall be lawful for such constable or constables to seize and carry away, or otherwise to secure the same; and if, upon a hearing before any two Justices of the Peace, they shall adjudge and determine that any such instrument, apparatus, or other thing, has been used, or is capable of being used, for either of the purposes aforesaid, they may adjudge the same to be forfeited, and such forfeiture may be in addition to any penalty which may be imposed on any person under this Act in respect of such instrument, apparatus, or other thing.

5. Any instrument, apparatus, or other thing which shall be adjudged to be forfeited under the provisions of this Act shall be sold or otherwise disposed of in such manner as the Governor shall direct, and if sold the net proceeds of such sale shall be paid into the public treasury, after payment thereof of such reward, if any, as the Governor shall award to the informer, or to any constable or constables executing the search-warrant under which such articles were seized.

6. This Act shall continue in force until and throughout the last day of December, 1907. (By the *Wireless Telegraphy Act Continuing Act, 1907*, the Act of 1903 is continued in force indefinitely.)

THE WIRELESS TELEGRAPH ACT, 1909.

B The Governor having informed the Legislature that a despatch has been received from the Secretary of State for the Colonies drawing attention to the desirability of making Regulations as to the use of Wireless Telegraphy apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, it was deemed expedient to confer on the Governor in Council the power to make such Regulations as may be necessary for the purpose aforesaid, and the following Act came into force in March, 1909:—

1. It shall be lawful for the Governor in Council to make regulations as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, for preventing such apparatus being worked so as to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established or worked in these islands, or with the transmission of messages between any such station and ships at sea.

2. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whilst in the territorial waters of these islands shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

3. Any regulations made under this Act may impose fines for any breach thereof not exceeding £20 for a single offence, and not exceeding £5 a day for a continuing offence, and such fines shall be recoverable with costs in any Court of Summary Jurisdiction consisting of any two Justices of the Peace.

4. All regulations made under this Act shall become operative on the date of their publication in the *Gazette*, or on such later date as shall be fixed by the regulations for the purpose.

BOLIVIA

(See Maps 48 and 52.)

THIS State possesses no seaboard, and, therefore, no maritime stations. The Government consists of a President, two Vice-Presidents and five Ministers of State.

CONTROL.

Wireless telegraphy forms at present a branch of the Posts and Telegraphs, which is administered by the State.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. Abdon Saavedra	Minister of Government and Public Works ..	La Paz
Mr. R. Villalobos	Director-General of Posts and Telegraphs ..	La Paz
Mr. Humberto Asin	Chief of Radiotelegraphic Service	La Paz

ORGANISATION.

Bolivia entered the International Telegraphic Convention on June 1st, 1907, in the fourth category, and gave in its adherence to the International Radiotelegraphic Convention on October 29th, 1915.

At present the following stations are in operation : Viacha, which owing to its proximity to the capital is the first or central station of the Republic. It communicates with the Peruvian stations of Lima and Cachendo, and with the Bolivian stations of Riberalta, Yacuiba, Trinidad.

Riberalta has the same power as that of Viacha, communicating with the Brazilian stations of Porto Velho, Sena Madureira, the Peruvian stations of Yquitos and Cachendo, and the Bolivian stations of Viacha, Cobija, Trinidad, Villa Bella, Cachuela Esperanza and Guayaramerin.

Yacuiba, also, is of the same type as the two previous ones. Its service with foreign nations is with Asuncion (Paraguay), and it also communicates with Antofogasta (Chile), but its principal aim is to communicate with the stations known as the Pilcomayo stations, so named from their being situated on the banks of that river.

Trinidad communicates with the stations of Viacha and Riberalta.

Cobija communicates with Riberalta and the Brazilian station of Xapury.

Cachuela Esperanza, Manoa, Villa Bella and Guayaramerin communicate between themselves and with Riberalta.

The stations called the Pilcomayo stations are installed at the small military forts of Ballivian, D'Orbigny and Esteros.

A radiotelegraphic school was established during 1917 in La Paz, under the direction of Mr. Asin, the Superintendent of Radiotelegraphy. There are no wireless clubs or societies in the Republic.

ADMINISTRATION.

At present no special laws or regulations have been passed for the administration of wireless, but a Bill for that purpose is in course of being drafted.

BRAZIL

(See Maps 48 to 53)

CONTROL.

THE radiotelegraphic stations of the country are exclusively under the control of the Government, and their administration is regulated by the Minister of Public Works with respect to installations of a civil character, and by the Ministers of State for War and the Navy with respect to installations destined for national defence and the services of the military and naval forces.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Dr. Pires do Rio	Minister of Public Works	Ministerio da Viação
Dr. Antonio Nogueira Penido	Director-General of Telegraphs	Reparticao Geral dos Telegraphos.
Dr. Francisco Bhering ..	Sub-Director Technical Department	Do.
Dr. Veiga Miranda ..	Minister of Marine	Ministerio da Marinha
Admiral Max de Frontin ..	Chief Naval Staff	Do.
Capt. Tenente Mario do Barros Barreto	Chief Naval Radio Service	Do.
Dr. Pandia Calogeras ..	Minister of War	Ministerio da Guerra.
Lt. Aranha de Vasconcellos	Chief of Army Radio Service	Do.

ORGANISATION.

The radiotelegraph service of the Brazilian coast serves both the Navy and the National Telegraph. All radio stations are connected with the National Telegraph system for the purposes of radiotelegraphic traffic giving through services with the interior.

There are no direction finding stations, but time signals and meteorological bulletins are sent out from the Ilha do Governador Naval Radio Station in accordance with the Eiffel Tower programme.

There are no private, experimental or amateur transmitting stations. Amateurs are now allowed to install receiving stations, though no special form of licence has yet been adopted. A station has been installed in the Telegraph Pavilion at Praia Vermelha for broadcasting market reports and weather bulletins. Another station will be installed at Belle Horizonte, the capital of the state of Minas Geraes. The Radio Society of Rio de Janeiro has also been granted permission to install a station.

Meteorological reports and bulletins are transmitted free to all ships by the coast stations under the control of the Telegraph Department.

The stations working up to August, 1923, comprise:—

Coast Stations controlled by the Ministry of Public Works ..	6
Inland Stations controlled by the Ministry of Public Works ..	10
Coast Stations controlled by the Ministry of War	7
Coast Stations controlled by the Ministry of Marine	13
Coast Stations controlled by the Ministry of Agriculture ..	1
Naval Ship Stations	35
Merchant Ship Stations	140

A new high power station is in course of erection in Rio de Janeiro for transoceanic communication.

During the past year the Radio Society of Brazil has been formed with Dr. Henrique Morize, Director of the National Observatory, as President. This Society has petitioned for leave to erect a broadcasting station.

ADMINISTRATION.

A Commission composed of members of the Civil, Naval, Military and Educational authorities are studying the Decree, No. 3,296 of July 10th, 1917, with a view to modifying it. The regulations for administering this law are nearing completion.

No regulations have yet been published regarding Aviation.

The following laws and regulations govern the administration of wireless in the Republic —

A—Extract from Act relating to the Brazilian Merchant Service.

B—Extract from Law No. 2,719 of December 31st, 1912.

C—Law 2,738 of January 4th, 1913.

D—Decree No. 3,296 of July 10th, 1917.

ACT RELATING TO THE
MERCHANT SERVICE.

A The following Articles refer to Wireless Telegraphy :—

ART. 159.—Those boats must without exception be provided with radiotelegraphic apparatus, approved by the General Direction of Telegraphs, with the necessary power to allow of communication with the wireless stations in the zones in which they trade, when :

(a) They carry passengers and are employed in the coastal trade, or any description whatsoever, and have a registered tonnage of over 300 tons, and for those boats employed in river trade having a registered tonnage of over 500 tons.

(b) They are only employed in the coastal trade as cargo boats, but carry over 30 (thirty) souls all told.

ART. 160.—After the promulgation of this regulation, no ship shall be registered by any Port Authority if it has not complied with the regulations of the preceding Article, the licence to navigate being refused to any ship which, within one year from the date of the promulgation of this regulation, shall not have fulfilled the depositions set forth herein.

LAW No. 2,719.

DECEMBER 31ST, 1912.

B The above Law fixes the Coast Tax at 6 francs for a telegram up to 10 words, and 60 centimes for each extra word. Included in the rate is the transmission between a coast station and the telegraph stations to which the wireless station is directly joined up.

There is a land telegraph charge (*via* National lines) of 25 centimes a word without minimum on telegrams destined to telegraph stations which are not directly connected up with a coast station.

For telegrams exchanged between Brazilian coast stations and ships flying the Brazilian flag the ship tax has been fixed at 240 reis a word with a minimum of 10 words, the coast tax at 400 reis a word with a minimum of 10 words, and the land telegraph charge (if any) at 200 reis a word without a minimum.

LAW No. 2,738.

JANUARY 4th, 1913.

C A new wireless district was created by the above Law, with a credit of 732 contos, to include the Acre, Amazonas, and Para wireless stations, and these stations have since been taken over by the Telegraph Department and opened to public traffic.

WIRELESS LAW No. 3,296.

JULY 10TH, 1917.

D The National Congress resolves :—
ART. 1.—The service of radiotelegraphs (telegraphs without wires) in the territories and territorial waters of Brazil is exclusively within the sphere of federal Government.

Sole Paragraph.—The service of radiotelegraphy comprises also radiotelephony (telephones without wires).

ART. 2.—The establishment and exploitation of radiotelegraph stations are within the sphere of the Ministry of Public Works, in respect to its application of a civil character and the Ministries of War and Marine in reference to its applications destined to national defence and to the service of the Army and Navy.

Sole Paragraph.—The three above-mentioned Ministries will enter into an agreement in respect to the localities in which must be established the stations necessary for commerce, for navigation and for the defence of the national territory.

ART. 3.—The Government may give permission to third parties, nationals, without monopoly whatsoever, to install or work one or more high-power stations in suitable places on the littoral; under the terms of the International Regulations concerning wireless telegraphy and also the Brazilian regulations which are in force for the execution of the same service; for the exclusive purpose of establishing inter-oceanic and inter-territorial communications with corresponding stations in other countries.

PAR. 1.—These stations must be linked with the National Telegraphs, by whose intermediary shall be collected and distributed the international radiotelegraphic service to and from Brazil in such a manner that the Government shall receive the terminal rate in force.

PAR. 2.—The rights that are conferred and the disposals contained in this article may only be used by the Government after the conclusions adopted in respect to this subject by the International Pan-American Convention, which at the recent conference in Buenos Aires was arranged should be held at Washington in 1917.

ART. 4.—The States within the area of their territories which are not yet served by telegraphs with or without wires, and may wish to establish radiotelegraphic stations, shall interest the Department of Telegraphs to install and work them, debiting the respective costs against such States, and for the purposes of the adjustment of the accounts shall be considered as mutual traffic administrations with the Department.

ART. 5.—The National shipping companies whose steamers have accommodation for more than 50 passengers and whose voyages are longer than 150 miles from the port of origin of its ships and the site of the registered office of the company must install on board of such steamers a radiotelegraphic station with a minimum range of 100 nautical miles, which shall be worked by an operator who holds a certificate of fitness granted by competent authority. The installations on board shall be provided with emergency apparatus and battery which will permit a continuation of the service in case of the failure of supply of electrical energy by the generators that depend on the main installation.

ART. 6.—Foreign ships will be permitted within or without the territorial waters of Brazil to use the radiotelegraphic stations which they have mounted on board to correspond with the coastal stations erected by the Department of Ways and Public Works previously being authorised by the same Ministry or the Department to this end and subject to the prescriptions and regulations governing this service.

Paragraph.—Foreign warships will be licensed by the authority designated by the Minister for Marine.

ART. 7.—The establishment and working of the coastal radiotelegraphic stations and others of a civil character in the interior of the country will be entrusted to the Department of Telegraphs, to which will fall the duty also of the superintendence and carrying out of all the service of fiscalisation in relation to the

employment of this kind of telegraph system by the State by national shipping companies whether by fixed or moving stations and the execution of administrative acts, the promulgation of the dates of openings, the range and the class of each station and the inauguration of proceedings relative to misdemeanours committed against this branch of the service.

Sole Paragraph.—The said Department shall create a special section to which shall be entrusted the management of the service, and also it shall form a school of radiotelegraphy and it shall have authority to contract within or without the country with a professional teacher to take charge of the said school. The only persons qualified or admissible for the personnel of the said radiotelegraphic stations shall be nationals, holders of a certificate of competency issued by the above school, or by other holders of diplomas, admitted to work in the country.

ART. 8.—Also the radiotelegraphic stations that were established in Brazilian territory and on board of national ships and on board of foreign ships whilst they remain or navigate on the rivers or territorial waters of Brazil, and claim to establish communication with the national stations for this purpose authorised, must be subject to the rules and regulations of the interior and international services that may be in force.

ART. 9.—Radiotelegraphic correspondence is authorised between national mercantile ships and also between them and foreign ships that possess radiotelegraphic stations aboard as well as between the said ship and the Brazilian coast stations dependent upon the Ministry of Public Works.

ART. 10.—Whatever concession to persons for the establishment of a radiotelegraphic service or whatever authorization given to use the respective apparatus installed on board foreign ships may be revoked if they do not comply with the rules and regulations or if the Ministries of Marine and War judge it necessary for the security of the country or its defence.

ART. 11.—When the civil or military Federal authorities dependants of the Ministries referred to in Art. 2 have to make scientific or technical experiments in radiotelegraphy they must give notice to the Ministries to which they depend, and when they make experiments on behalf of functionaries of other Ministries, then they must give notice to the Ministry of Ways and Works.

ART. 12.—No other besides the Federal authorities may make experiments or establish experimental radiotelegraphic stations without previous permission of the Ministry of Ways and Public Works, who can give the same with the restrictions and cautions necessary for the security and interests of the State and the efficiency of the traffic of the official stations.

ART. 13.—All the rules and regulations of the Department-General of Telegraphs shall apply to the service of radiotelegraphy with reference to the secrecy to telegrams and as to damages caused to the stations or their material.

ART. 14.—The Government will proceed in the terms of the legislation in force against those who, without permission, exploit, whether publicly or clandestinely, a radiotelegraphic service, and in time of the disturbance of public order or external war these offences shall be classified and punished in the first case as an act of resistance to constituted authority and in the last case as an act of spying.

ART. 15.—Those coastal and interior radiotelegraphic stations which are dependencies

of the Ministry of Ways and Public Works, and not reserved for special purposes, will be open for public correspondence.

Sole Paragraph.—No responsibility will be accepted by the radiotelegraphic service for errors of the service or faulty delivery of telegrams, in the terms of Art. 41 of the regulations revised in London.

ART. 16.—Any Brazilian radiotelegraphic station, whether civil or military, terrestrial or marine, will be obliged to give preferential attention to calls for succour that are received by them.

ART. 17.—In all radiotelegraphic stations the public service shall have preference to private service, save in case of *force majeure* (accidents and calls for succour).

ART. 18.—Whatever be the object for which radiotelegraphy be established the respective services shall be organised in a form not to cause disturbance to other radiotelegraphic stations, and the respective Ministries shall in all cases adopt provisions and rules necessary to such end.

ART. 19.—Radiotelegrams proceeding from a ship which flies the flag of a non-adherent country to the regulations upon radiotelegraphs of the Convention of London as well as those addressed to ships of such countries shall be transmitted by Brazilian stations only in cases where the respective country has previously declared that it will conform to those rules and regulations in the adjustment of accounts.

ART. 20.—When the Ministries of Marine or War have to establish radiotelegraphic stations for special ends in strategic points and fortified places on land or sea, they will proceed in agreement with each other and with the Ministry of Ways and Public Works when choosing of the site and deciding upon the manner of carrying out the work, to the end that they shall not interfere with their mutual traffics.

These stations may be worked by telegraphists of the civil administrations.

Whilst civil functionaries man the stations established in strategical or fortified places they shall be subject to military regime.

ART. 21.—All coastal radiotelegraph stations worked by the Department of General Telegraphs must receive and transmit meteorological observations, and there must be provided installations at one or more stations of the apparatus necessary to transmit time signals in the manner established by the Time Conference held in Paris in October, 1912.

Sole Paragraph.—The national ships provided with apparatus for wireless telegraphy and the foreign ships in the same condition can signal to the coast stations when they are within reach of them their observations about the weather, which will be communicated to the Meteorological Observatory of Rio de Janeiro, and to the ships, on the other hand, will be communicated the observations from that Observatory.

ART. 22.—To the radiotelegraphic service of Brazil are applicable the International Radiotelegraphic Convention held in London and the rules which may be laid down for the execution of the present law.

ART. 23.—The adjustment of accounts shall be made six-monthly between the Department General of Telegraphs and the agencies of the companies of national and foreign ships, and in their absence with the administrations to which those ships are attached in accordance with what is established by Art. XLII of the International Regulations (revised in London).

ART. 24.—The call letters of the stations on board the national war and merchant ships will be distributed by the Department of General Telegraphs in accordance with the series of indicators reserved for Brazil by the Secretary of the International Union of Telegraphs of Berne.

ART. 25.—The radiotelegraphic stations in the interior of the country shall be established and worked by the Department of General Telegraphs, organising proper radiotelegraphic districts in regions where there are none, connecting them with the telegraphic service

by means of wired lines and working with a parallel service of wired telegraphs.

ART. 26.—Annulling all whatsoever acts in this connection effected by the Government prior to the promulgation of the present law.

ART. 27.—It shall be the sphere of the Ministry of Ways and Public Works to make provision for the establishment and initiation of an international radiotelegraphic service with the adjoining countries as well as the drawing up of the basis of a definite agreement and referendum to the National Congress.

ART. 28.—All previous acts to the contrary are revoked.

BRITISH GUIANA

(See Maps 48 and 51)

Including : Demerara.

CONTROL AND ORGANISATION.

Both the ownership and working of all radiotelegraphic stations are vested in the Government. Only one station is open for public correspondence with ships.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. G. Spain, M.Am.I.F.E., M.I.R.E.	Officer-in-Charge, British Guiana Wireless Department	Georgetown, British Guiana

ADMINISTRATION.

The administration of wireless telegraphy is carried out under the following regulations :—

A—The Telegraphic Ordinance, 1903.

B—Ordinance No. 7 of 1910.

A This Ordinance may be cited as "The Telegraph Ordinance, 1903."

2. In this Ordinance "telegraph" means an electric, galvanic, or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communication by means of electricity, galvanism or magnetism, whether the same be transmitted by means of wires or cables or without wires or cables.

3. The Governor-in-Council shall have the exclusive privilege of establishing, maintaining and working telegraphs between the Colony and places outside of the Colony.

Provided that the Governor-in-Council may grant a licence on such conditions and in consideration of such payments as he thinks fit, to any person, company or body corporate, to establish, maintain or work a telegraph between the Colony and any place or places outside the Colony; and

Provided that nothing in this Ordinance shall apply to or in any way affect the rights already granted to the West India and Panama Telegraph Company, Limited, under any Ordinance or Ordinances passed before the commencement of this Ordinance.

ORDINANCE No. 7 of 1910.

B 1. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony, except under and in accordance with a licence granted in that behalf by the Governor-in-Council.

(2) A person shall not work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor-in-Council, and the Governor-in-Council may by any such regulations, impose penalties recoverable summarily for the breach of any such regulations, not exceeding fifty dollars for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

(3) If any such person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding fifty dollars, and on conviction on indictment, to a fine not exceeding five hundred dollars, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

(4) If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship

within his jurisdiction without a licence in that behalf or contrary to the provisions of the regulations made under sub-section two of this section, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Governor or the Postmaster-General and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

(5) The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided, That nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1910.

BRITISH HONDURAS

(See Maps 43 and 44.)

CONTROL.

THE ownership and working of the one radiotelegraphic station at Belize, in the Crown Colony of British Honduras, is vested in the Government. It is open for continuous ship service and has been recently refitted with a 25 kW. arc transmitter, the intention being to bridge the Admiralty station at Jamaica. An experimental licence has been granted to St. John's Roman Catholic College in Form 2 issued by H.B.M. Postmaster-General in 1905.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Gerald S. W. Smith ..	Colonial Postmaster	Belize
Mr. James Owen Hall ..	Superintendent of Wireless Telegraphs	Belize.

Laws are being prepared for the regulation of private stations in accordance with the London Convention of 1912.

ADMINISTRATION.

Wireless telegraphy in British Honduras is regulated by Chapter CXCIX of the Consolidated Laws of British Honduras (revised edition), the text of which will be found below.

A—Consolidated Law.

B—Regulations.

C—Licence to use Wireless Telegraphy for Experimental Purposes.

CHAPTER CXCIX OF THE CONSOLIDATED LAWS OF BRITISH HONDURAS (REVISED EDITION). TO REGULATE WIRELESS TELEGRAPHY.

A 1. *Interpretation.*—In this chapter "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wires connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *Licence to Install, &c., Wireless Telegraphic Apparatus.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine and shall contain the terms, conditions and restrictions on any subject to which it is granted.

3. *Apparatus not to be worked on merchant ships except in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this chapter.

4. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purpose of this chapter, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this chapter.

(2) The regulations in the schedule to this chapter shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the

Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrants.*—If a District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship contrary to the provisions of this chapter or of any regulations made under this chapter, or of any licence granted under this chapter, he may grant a search warrant to any police officer or any person appointed in that behalf by the Superintendent of Police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalty for contravention of chapter.*—

(1) Any person who shall offend against any provision of this chapter or any regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding two hundred and fifty dollars, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) *Procedure.*—Proceedings shall be taken before the District Commissioner for the Belize District on the complaint of the Superintendent of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE—Section 4 (a). REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

ii. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

LICENCE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES.

EXPERIMENTAL FORM 2.

Dated

C This Indenture made the _____ day of _____ One thousand _____ nine hundred and _____ between the Colonial Secretary of the Colony of British Honduras on behalf of the Government of British Honduras of the one part and (hereinafter called "the licensee") of the other part.

Whereas the licensee is desirous of establishing installing and working an amateur wireless telegraph apparatus for demonstration purposes with the sole object of giving instruction in the Science Classes of Saint John's College;

And whereas by reason of the provisions of Chapter 199 of the Consolidated Laws (Revised Edition) it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place except under and in accordance with a licence granted in that behalf by the Governor and it is also unlawful save as in the said Law provided to transmit wireless telegrams within the Colony;

And whereas at the request of the licensee the Governor has agreed to grant to the licensee the licence powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing;

Now this Indenture witnesseth that in consideration of the premises and of the matters hereinafter appearing it is hereby agreed and declared between and by the parties hereto and the licensee (as to the covenants and agreements hereinafter contained on his part) doth hereby covenant and agree with the Colonial Secretary and the Colonial Secretary (as to the covenants and agreements hereinafter contained on his part) in exercise of all powers and authorities enabling him in this behalf doth hereby covenant and agree with the licensee in manner following (that is to say):—

i. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in Chapter 199 of the Consolidated Laws (Revised Edition).

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

2. Subject to the provisions of this Indenture the licensee shall during the term or period commencing on the and terminating on the have licence and permission from the Colonial Secretary—

to establish install and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule.

3. The licensed apparatus shall not be used by the licensee or by any person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

4. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony or the territorial waters abutting on the coasts thereof and in particular with the transmission or receipt of any messages between or at any wireless telegraph station established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions, which shall be given to the licensee by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

5.* (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at the station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indications that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall if so required in writing by the Colonial Secretary cease to use the licensed apparatus.

(4) If the Colonial Secretary is of opinion that the working of the licensed apparatus at the station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this indenture.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by the Government of the Colony.

* This clause will be omitted in the case of inland installations.

7. The Colonial Secretary and his engineers and agents may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the Colonial Secretary the right for the purpose aforesaid of entry from time to time into and on such station and premises as may be in the possession or occupation of any person or persons other than the licensee.

8. All apparatus used or intended to be used under this licence shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Colony.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by Wireless Telegraphy it shall be lawful for the Governor by warrant under his hand to direct and cause the licensed apparatus to be taken possession of in the name and on behalf of His Majesty.

10. The Colonial Secretary may at any time with the Governor's approval give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may by writing revoke and determine these presents and the licence powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said licence powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Any notice request or consent (whether expressed to be in writing or not) to be given by the Colonial Secretary under these presents may be served by sending the same by registered post letter to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Colonial Secretary.

Signed on behalf of the Government of British Honduras,

Colonial Secretary.

Witness.

Signed by the licensee on behalf of Belize, British Honduras,

Licensee.

Witness.

THE SCHEDULE BEFORE REFERRED TO:—

Name of Station.	CHARACTER OF APPARATUS.		
	Maximum Range of Signalling with the Licensee's Own Apparatus.	Power (Current and Voltage).	Source of Power.
(1)	(2) — miles	(3) Current and Voltage ..	(4) Batteries

BRITISH INDIA

(See Maps 16, 17 and 18)

Including : Baluchistan, Sikkim, Andaman and Nicobar Islands, Laccadive Islands.

CONTROL.

THE control of radiotelegraphy in India is vested in the Director-General of Posts and Telegraphs. With the exception of portable or semi-portable stations worked by the Military, Royal Air Force, and the mobile stations in ships of the Royal Indian Marine which are controlled by the Director, Royal Indian Marine, Bombay, all Government stations in British India are controlled by the Director-General of Posts and Telegraphs or the Local Government. Privately owned stations in British India are worked under licence from the Director-General.

In certain Indian States, state-owned stations are open. These work under conditions *specifically* laid down in each case by the Government of India pending the settlement of general conditions governing the erection and operation of stations in Indian States. There are no licensed stations in the Indian States.

The Indian Wireless Board was formed in 1920 to co-ordinate all radio requirements in British India.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. R. Clarke, C.S.I., O.B.E., M.L.A., I.C.S.	Director-General of Posts and Telegraphs ..	Simla
Commander R. L. Nicholson, D.S.O., late R.N.	Director of Wireless Telegraphs	Simla
Mr. P. J. Edmunds	Divisional Engineer, Wireless (Research) ..	Karachi
Mr. N. H. Swinstead	Divisional Engineer, Wireless (Traffic) ..	Simla
Mr. P. Ryan	Divisional Engineer, Wireless (Engineering) ..	Karachi
Mr. R. N. Hawes	Divisional Engineer, Wireless (Instruction) ..	Karachi
Mr. S. W. Longhurst	Assistant Divisional Engineer, Wireless ..	Simla
	Assistant Divisional Engineer, Wireless ..	Karachi

ORGANISATION.

The general organisation of radio stations and their intended development is set out in the following Memorandum of 26th January, 1922 :—

EXTRACTS FROM MEMORANDUM.**DEVELOPMENT OF WIRELESS COMMUNICATION IN BRITISH INDIA.**

Note (1).—This Memorandum has received the sanction of the Government of India.

Note (2).—It does NOT include wireless communication with the United Kingdom and other parts of the world, but the policy outlined will fit in with the scheme of Imperial Wireless Communications approved by the Imperial Government.

I.—DEFINITIONS.

Coast Station.—A station whose primary function is communication with ships at sea.

Inland Station.—A station whose primary function is communication with other fixed stations in British India.

II.—GENERAL.

Government of India have the exclusive privilege of erecting, maintaining and working wireless telegraphs in British India and exercise this right by maintaining stations open for public

correspondence and by granting licences to private individuals to erect and work wireless telegraphs in British India and in ships and aircraft registered in British India.

2. Besides a number of portable and semi-portable stations of small power which are employed as temporary stations where and when required and the stations in Sandheads Pilot Vessels, the Government of India maintain the following permanent stations:—

(a) *Coast Stations*.—Bombay, Calcutta, Karachi, Madras, Port Blair, Rangoon, Victoria Point.

(b) *Inland Stations*.—Allahabad, Delhi, Lahore, Mhow, Nagpur, Peshawar, Quetta, Secunderabad, Jutogh, Poona.

III.—COAST STATIONS.

3. Ordinarily about half the daily programme of these stations has to be given over to communication with Inland stations. At the large ports and important cities, a programme so divided neither fulfils the requirements of the ship traffic nor provides anything approaching the necessary service required by the Inland organisation. It is therefore necessary to have separate stations at such places, and it is intended to provide separate Inland and Coast stations at the following ports:—

Rangoon, Bombay, Calcutta, Madras, Karachi.

IV.—INLAND STATIONS.

5. (a) The Inland stations together with the Coast stations (during the times the latter are not working with ships) form the nucleus of an organised wireless service, which provides facilities for Government, public and press traffic at the Inland Telegraph rates between these places. This may be termed the "Inland System."

(b) The functions of the Inland system are to supplement land lines, relieve congestion thereon, and to provide an alternative for the same in case of interruption. At present no Inland stations are erected to connect places between which no land line exists, but there is no reason why this should not be done, if required.

(c) If the functions are to be performed and the system run on a commercial basis, stations must be equipped so that they are on an equality with land lines as regards speed of working and accessibility. Further, they must be used fully in normal times, so as to be kept efficient for service in emergency.

(d) At present the service is limited owing to:—

- (i) Low speed of working;
- (ii) Telegraph lines being generally capable of carrying the normal traffic;
- (iii) Stations being situated at a distance from the telegraph office, necessitating considerable rehandling of messages sent by wireless.

(e) It is intended to overcome these limitations by fitting high-speed apparatus and arranging that the stations are operated from the telegraph offices. It is also intended to fit all Inland stations with continuous wave apparatus;

V.—FEEDER STATIONS.

6. It will be seen, therefore, that apart from its temporary limitations the Inland system's facilities are restricted to the principal ports, cities and centres of India. In order to extend these facilities and feed and distribute from the Inland system in localities where such extension is necessary and to provide alternative routes for traffic, it is proposed to permit the installations of groups of small stations working as units.

7. Such a unit may consist of any number of stations termed "*Feeder Stations*," whose power, range, etc., will depend on the local requirements.

8. If it is required that a particular group of Feeder stations shall be linked to the Inland system, one station in the group must be close to the Inland station of the locality. This is termed the "*Main Feeder Station*" of the group.

9. If such linking is *not* required, no Main Feeder station is necessary.

10. If, however, such linking is required, but there is no Inland station in the locality, it may be provided by one of the following methods:—

(a) The erection of a Main Feeder station close to the nearest Inland station, making the necessary arrangements with the Local Government in whose locality such Inland station stands; or

(b) Arranging to use a Main Feeder station belonging to another Local Government if such is practicable.

11. *Not to work with Inland Stations*.—In no circumstance can a Feeder station *work direct* with an Inland station. It therefore follows that the type of installation required for Feeder stations is independent of the type of the Inland stations. They may be large, small, fixed, semi-fixed or portable; generally they will use telegraphy but may be fitted for telephony also, or telephony alone, according to local requirements and conditions.

12. *Communication with other localities*.—Normally this will be *via* the Inland system, but arrangements can be made in special cases to permit inter-communication between Feeder groups of different localities.

13. *General organisation*.—It is intended to develop the organisation on the following lines:—

(a) Government of India will be entirely responsible for the development and working of Inland stations.

(b) Local Governments may decide their requirements as to the necessity or otherwise of establishing Feeder stations for the purpose of promoting internal security and retain complete control as to their sites, numbers, hours and class of service, etc., subject to the sanction of the Government of India.

(c) Before deciding on the establishment of any Feeder station, Local Governments should consult the military authorities regarding the location and the actual site of the stations and give full consideration to their views. (This does not apply to military sets which are part of the equipment of the Army; they will normally not be part of the Feeder organisation.)

(d) Government of India will advise as to types most suitable for Feeder stations in any locality and are prepared to obtain, erect, maintain and work the Feeder stations on behalf of the Local Government in accordance with the local requirements, *provided* the local authorities undertake to acquire and maintain the sites and erect the necessary buildings and meet the initial and recurring costs, which will include charges on account of supervision and inspection.

(e) Licences will not be required for Feeder stations erected by Local Governments.

(f) The Government of India reserve to themselves the liberty to take over the system of Feeder stations in any locality on payment of the then value of the buildings and plant.

14. *Personnel.*—(a) The supervising and operating staff will normally be civil, but military personnel may be employed if the Local Government so decide. If civil, this staff may be recruited from General Service Telegraphists or locally according to the requirements of the Local Government.

If this staff is provided by the Department of Posts and Telegraphs, their costs will be included in the total cost of maintaining and working the stations.

(b) Menial staff (engine-drivers, peons, etc.) will be recruited locally, and may be paid by the Local Government or the Department of Posts and Telegraphs as may be most convenient. In the latter case, the Local Government will be debited with the cost.

15. *Apparatus and Plant.*—(a) The Local Government having indicated its requirements, the Department of Posts and Telegraphs will specify, order, obtain and erect the necessary apparatus, subject to the concurrence of the Local Government, the latter meeting the cost thereof which will include the necessary overhead charges.

(b) It is essential that the Department of Posts and Telegraphs should superintend the actual erection and installation of the apparatus, since they will have to look after it subsequently, and the importance of correct first fitting cannot be over-estimated; further, it is easier for the Wireless Engineering Branch efficiently to maintain machinery if they have erected it in the first place, than if they take over running machinery erected by another authority.

16. *Buildings.*—The Department of Posts and Telegraphs can specify the buildings required for any particular set and give approximate estimates, but they must be erected by the Local Government.

17. *Revenue.*—(a) Unless high-speed gear is fitted in the Feeder and Main Feeder stations (which, although not difficult, will in most cases be unnecessary owing to the comparatively small amount of traffic), it must be understood that these stations are more of an insurance against interruption and congestion upon land-lines than a commercial enterprise.

(b) In the first place Government of India propose that the following should be the general arrangement as regards revenue:—

(i) Except as provided in (iii) below, all messages sent by wireless shall be booked at the telegraph office. Nothing shall be handed in direct to the wireless station unless special instructions to that effect are given;

(ii) Subject to such limitations as the Government of India may from time to time impose, a Local Government shall be permitted to utilise its Feeder stations for the transmission of State traffic pertaining to it and within the limits of the province free of payment to the Central Government.

(iii) If desired, arrangements can be made for local State traffic as mentioned in (ii) to be handed in direct to the wireless stations;

(iv) In the event of interruption or congestion of traffic on the land-lines, public or commercial traffic may be transferred by arrangement between the Postmaster-General and the Local Government to a Feeder station for transmission. In such case the receipts shall be divided between the Department of Post and Telegraphs and the Local Government on terms which will be announced from time to time.

(v) In cases of emergency the Local Government shall have complete power to decide the communications which shall be

maintained between the stations, the class of traffic that shall be carried and every other matter concerning the working of the Feeder stations in the locality. Provided always that the Department of Posts and Telegraphs is kept aware of the arrangements made.

(vi) In all cases the Local Government shall have the power to decide the priority of traffic.

(vii) Unless arrangements are made to the contrary, messages passing from a Civil or Military Feeder group to the Inland system shall be paid for on entry into that system; the method of payment to be arranged between the administration responsible for the Feeder group and the Department of Posts and Telegraphs.

18. *Operation, Supervision and Upkeep.*—

(a) The Department of Posts and Telegraphs will be entirely responsible for training the supervising and operating staff, and will also be responsible that suitable and sufficient supervisors are placed in charge of stations or groups of stations.

(b) The Department of Posts and Telegraphs will also be responsible for advising the Local Government as to steps to be taken for the upkeep and improvement of stations, and are prepared to put into execution such orders as the Local Government may issue, provided that if such orders entail expenditure, the Local Government shall find the money.

(c) The Department of Posts and Telegraphs will also arrange for periodical inspections of the stations.

(d) The technical administration of the stations will be in the hands of the Divisional Engineer, Wireless Engineering Division, as is the case with Inland stations.

19. *Communications between the Local Government and Post and Telegraph Department.*—

(a) On general questions communications should be direct between the Local Government and the Director-General of Posts and Telegraphs.

(b) On purely technical questions it is desirable that the senior wireless officer in charge of the stations of the locality should be general adviser to the Local Government, and that all correspondence should be referred to him for remarks before being forwarded to the Director-General of Posts and Telegraphs.

(c) The Divisional Engineer, Wireless Engineering Division, should be allowed to correspond direct with the wireless officers in charge of stations on matters concerning the technical administration of such stations.

(d) The Director-General of Posts and Telegraphs or his representative should have free access to any of the stations at all times.

VI.—LICENSED STATIONS.

20. Licences to import, erect, maintain and work wireless telegraphs in British India may be granted to persons approved by the Government of India. These licences will embrace the following types of stations:—

(a) Non-commercial stations, which are those erected for experimental, instructional and research purposes and by amateurs.

(b) Limited commercial stations, which are those erected to provide wireless facilities for the purpose of business or private communications, which facilities the Government of India are unable or unwilling to provide. Licences for these stations will be given on the understanding that the Government of India or Local Government shall be at

liberty to take over the station at any time on a 12 months' notice and on payment of such valuation of the buildings and plant as may be agreed between the parties, subject to reference to arbitration in the case of failure of agreement.

21. Licences will be issued to approved applicants on behalf of the Governor-General in Council by the Telegraph Authority (Director-General of Posts and Telegraphs) subject to the concurrence of the Local Government concerned. Applications for licences should normally be forwarded through the Local Government, and in all cases will be referred to the Local Government for remarks and concurrence before the licence is issued.

22. Licensed stations will be of small power and may be used for private communications, research, experiment or instruction. They may be either telegraph or telephone sets.

23. The licences provide, *inter alia*, for:—

(i) The protection from interference with Government of India, Local Government and other licensed stations;

(ii) Government of India to take them over in times of emergency;

(iii) Inspection by Government of India.

24. Licensed stations will be entirely controlled by the Department of Posts and Telegraphs (Wireless Branch) subject to such consultation with and reference to the Local Government concerned as may be necessary.

* * * * *

ADMINISTRATION.

The administration of radio in British India is governed by the following Acts, Notifications and Regulations:—

A—Indian Telegraph Act, 1885, as modified by subsequent Acts (VII and XIV of 1914).

B—Notifications under the Sea Customs Act, 1878.

C—Notifications under the Indian Telegraph Act.

D—Extracts from the Indian Merchant Shipping Act, 1923, and Notifications under the same.

E—General Instructions governing Licences for Wireless Telegraphs in British India.

F—Import (Wireless Telegraphs) Licence.

G—Fixed Stations Licence.

H—Mobile Stations Licence.

Licences to work wireless telegraphs for business or experimental or instructional purposes are issued, and the question of permitting "Broadcasting" under licence by private individuals is being considered.

The situation as regards radio in the Indian States is not quite so clear as in British India, but Government are taking steps to obtain the co-operation of the States and are endeavouring to make the conditions therein similar to those obtaining in British India.

INDIAN TELEGRAPH ACT, 1885.

ACT No. XIII OF 1885.

[As amended by Act, 1914 (VII of 1914) and Act, 1914 (XIV of 1914).]

An Act to amend the law relating to Telegraphs in India.

A *Whereas it is expedient to amend the law relating to Telegraphs in India, it is hereby enacted as follows:—*

PART I.—PRELIMINARY.

1. (1) This Act may be called the Indian Telegraph Act, 1885;

(2) It extends to the whole of British India including the Sonthal Parganas and the pargana of Spiti, and it applies also to—

(a) All native Indian subjects of His Majesty in any place without and beyond British India,

(b) All other British subjects within the territories of any Native State in India, and

(c) All servants of the King, whether British subjects or not, within the territories of any native State in India.

(3) It shall come into force on the first day of October, 1885.

2. The Indian Telegraph Act, 1876, is hereby repealed.

But all licences granted and rules made under that Act or any Act thereby repealed, and now in force, shall, so far as they could be granted or made under this Act, be deemed to have been respectively granted and made hereunder.

3. In this Act, unless there is something repugnant in the subject or context:—

(1) "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for making, transmitting or receiving telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism;

(2) "Telegraph officer" means any person employed either permanently or temporarily in connection with a telegraph established, maintained, or worked by the Government, or by a person, licensed under this Act;

(3) "Message" means any communication sent by telegraph, or given to a Telegraph officer to be sent by telegraph, to be delivered;

(4) "Telegraph line" means a wire or wires used for the purpose of a telegraph with any casing, coating, tube or pipe enclosing the same and any appliances and apparatus connected therewith for the purpose of fixing or insulating the same;

(5) "Post" means a post, pole, standard, stay, strut or other above ground contrivance for carrying, suspending or supporting a telegraph line;

(6) "Telegraph authority" means the Director-General of Posts and Telegraphs, and includes any officer empowered by him to perform all or any of the functions of the Telegraph authority under this Act:

(7) "Local authority" means any Municipal Committee, District Board, body of Port Commissioners or other authority legally entitled to, or entrusted by the Government with, the control or management of any Municipal or Local fund.

PART II.—PRIVILEGES AND POWERS OF THE GOVERNMENT.

4. (1) Within British India, the Governor-General in Council shall have the exclusive privilege of establishing, maintaining and working telegraphs:

Provided that the Governor-General in Council may grant a licence, on such conditions and in consideration of such payments as he thinks fit, to any person to establish, maintain or work a telegraph within any part of British India.

Provided further that the Governor-General in Council may, by rules made under this Act and published in the *Gazette of India*, permit, subject to such restrictions and conditions as he thinks fit, the establishment, maintenance and working—

(a) Of wireless telegraphs on ships within Indian territorial waters, and

(b) Of telegraphs other than wireless telegraphs within any part of British India.

(2) The Governor-General in Council may, by notification in the *Gazette of India*, delegate to the telegraph authority all or any of his powers under the first proviso to sub-section (1).

The exercise by the telegraph authority of any power so delegated shall be subject to such restrictions and conditions as the Governor-General in Council may, by the notification, think fit to impose.

5. (1) On the occurrence of any public emergency, or in the interest of the public safety, the Governor-General in Council or a Local Government, or any officer specially authorised in this behalf by the Governor-General in Council may—

(a) Take temporary possession of any telegraph established, maintained or worked by any person licensed under this Act; or

(b) Order that any message or class of messages to or from any person or class of persons, or relating to any particular subject brought for transmission by, or transmitted, or received by, any telegraph, shall not be transmitted, or shall be intercepted, or detained, or shall be disclosed to the Government or an officer thereof mentioned in the order.

(2) If any doubt arises as to the existence of a public emergency, or whether any act done under sub-section (1) was in the interest of the public safety, a certificate signed by a Secretary to the Government of India or to the Local Government shall be conclusive proof on the point.*

* As supplied to the Hyderabad Residency Bazaars, the Cantonment of Secunderabad (inclusive of the area hitherto known as the "Contingent Station" of Bolarum), the Cantonment (hitherto known as the "Contingent Station" of Aurangabad) and the Railway lands in the territories of His Highness the Nizam of Hyderabad (other than the Railway lands in Berar and those in the Notifications of the Government of India in the Foreign Department, No. 4564-I, dated the 18th November, 1891, and No. 3244-I. B, dated 26th August, 1897); for "to the Local Government" read "First Assistant Resident" (*vide* Foreign Department Notification No. 531-I. B., dated 4th February, 1904).

6. Any Railway Company, on being required so to do by the Governor-General in Council, shall permit the Government to establish and maintain a telegraph upon any part of the land of the Company, and shall give every reasonable facility for working the same.

7. (1) The Governor-General in Council may, from time to time, by notification in the *Gazette of India*, make rules consistent with this Act for the conduct of all or any telegraphs established, maintained or worked by the Government or by persons licensed under this Act.

(2) Rules under this section may provide for all or any of the following, among other matters, that is to say:—

(a) The rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted;

(b) The precautions to be taken for preventing the improper interception or disclosure of, messages;

(c) The period for which, and the conditions subject to which telegrams and other documents belonging to, or being in the custody of, Telegraph officers, shall be preserved; and

(d) The fees to be charged for searching for telegrams or other documents in the custody of any Telegraph officer.

(3) When making rules for the conduct of any Telegraph established, maintained or worked by any person licensed under this Act the Governor-General in Council may, by the rules, prescribe fines for any breach of the same:

Provided that the fines so prescribed shall not exceed the following limits, namely:—

(i) When the person licensed under this Act is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees, for every day after the first during the whole or any part of which the breach continues;

(ii) When a servant of the person so licensed or any other person, is punishable for the breach, one-fourth of the amount specified in clause (i).

8. The Governor-General in Council may, at any time, revoke any license granted under section 4, on the breach of any of the conditions therein contained or in default of payment of any consideration payable thereunder.

9. The Secretary of State for India in Council shall not be responsible for any loss or damage which may occur in consequence of any Telegraph officer failing in his duty with respect to the receipt, transmission or delivery of any message; and no such officer shall be responsible for any such loss or damage, unless he causes the same negligently, maliciously or fraudulently.

NOTE.—The Telegraph Act was declared in force in Upper Burma (except the Shan States) by the Upper Burma Laws Act, 1886 (XX of 1886), s. 6 (1) and is in force there under s. 4. and the First Schedule to the Burma Laws Act 1898 (XIII of 1898) Bur. Code by which Act XX of 1886 has been repealed; in the Santhal Parganas by the Santhal Pargana Settlement Regulations (III of 1872), s. 3, as amended by the Santhal Parganas Justice and Laws Regulation, 1899 (III of 1899), s. 3, Ben. Code; in British Baluchistan see s. 3 and Schedule to the British Baluchistan Laws Regulation, 1900 (I of 1890), Bal. Code; and in the Angul District by notification under s. 5 of the Angul District Regulation, 1894 (I of 1894), Ben. Code, see *Calcutta Gazette*, 1904, Pt. I, p. 1298.

PART III.—POWER TO PLACE TELEGRAPH LINES AND POSTS.

10. The telegraph authority may, from time to time, place and maintain a telegraph line under, over, along or across, and posts in or upon any immovable property:

Provided that—

(a) The Telegraph authority shall not exercise the powers conferred by this section except for the purposes of a telegraph established or maintained by the Government, or to be so established or maintained;

(b) The Government shall not acquire any right other than that of user only in the property under, over, along, across, in or upon which the Telegraph authority places any telegraph line or post; and

(c) Except as hereinafter provided, the Telegraph authority shall not exercise those powers in respect of any property vested in or under the control or management of any local authority, without the permission of that authority; and

(d) In the exercise of the powers conferred by this section, the Telegraph authority shall do as little damage as possible, and, when it has exercised those powers in respect of any property other than that referred to in clause (c), shall pay full compensation to all persons interested for any damage sustained by them by reason of the exercise of those powers.

11. The Telegraph authority may, at any time, for the purpose of examining, repairing, altering or removing, any telegraph line or posts, enter on the property under, over, along, across, in or upon which the line or post has been placed.

PROVISIONS APPLICABLE TO PROPERTY VESTED IN OR UNDER THE CONTROL OR MANAGEMENT OF LOCAL AUTHORITIES.

12. Any permission given by a local authority under section 10, clause (c), may be given subject to such reasonable conditions as that authority thinks fit to impose, as to the payment of any expenses to which the authority will necessarily be put in consequence of the exercise of the powers conferred by that section, or as to the time or mode of execution of any work, or as to any other thing connected with or relative to any work undertaken by the Telegraph authority under those powers.

13. When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property vested in or under the control or management of a local authority, and the local authority, having regard to circumstances which have arisen since the telegraph line or post was so placed, considers it expedient that it should be removed or that its position should be altered, the local authority may require the Telegraph authority to remove it or alter its position, as the case may be.

14. The telegraph authority may, for the purpose of exercising the powers conferred upon it by this Act in respect of any property vested in or under the control or management of a local authority, alter the position thereunder of any pipe (not being a main) for the supply of gas or water, or of any drain (not being a main drain):—

Provided that—

(a) When the Telegraph authority desires to alter the position of any such pipe or drain, it shall give reasonable notice of its intention to do so, specifying the time at which it will begin to do so, to the local authority, and, when the pipe or drain is not under the

control of the local authority, to the person under whose control the pipe or drain is;

(b) A local authority or person receiving notice under clause (a) may send a person to superintend the work, and the Telegraph authority shall execute the work to the reasonable satisfaction of the person so sent.

15. (1) If any dispute arises between the Telegraph authority and a local authority in consequence of the local authority refusing the permission referred to in section 10, clause (c), or prescribing any condition under section 12, or in consequence of the Telegraph authority omitting to comply with a requisition made under section 13, or otherwise in respect of the exercise of the powers conferred by this Act, it shall be determined by such officer as the Local Government may appoint either generally or specially in this behalf.

(2) An appeal from the determination of the officer so appointed shall lie to the Local Government; and the order of the Local Government shall be final.

PROVISIONS APPLICABLE TO OTHER PROPERTY.

16. (1) If the exercise of the powers mentioned in section 10 in respect of property referred to in clause (d) of that section is resisted or obstructed, the District Magistrate may, in his discretion, order that the Telegraph authority shall be permitted to exercise them.

(2) If, after the making of an order under sub-section (1), any person resists the exercise of those powers, or, having the control over the property, does not give all facilities for their being exercised, he shall be deemed to have committed an offence under section 188 of the Indian Penal Code.

(3) If any dispute arises concerning the sufficiency of the compensation to be paid under section 10, clause (d), it shall, on application for that purpose by either of the disputing parties to the District Judge within whose jurisdiction the property is situate, be determined by him.

(4) If any dispute arises as to the persons entitled to receive compensation, or as to the proportions in which the persons interested are entitled to share in it, the Telegraph authority may pay into the Court of the District Judge such amount as he deems sufficient, or, where all the disputing parties have in writing admitted the amount tendered to be sufficient, or the amount has been determined under sub-section (3), that amount; and the District Judge, after giving notice to the parties and hearing such of them as desire to be heard, shall determine the persons entitled to receive the compensation, or, as the case may be, the proportions in which the persons interested are entitled to share in it.

(5) Every determination of a dispute by District Judge under sub-section (3) or sub-section (4) shall be final:

Provided that nothing in this sub-section shall affect the right of any person to recover by suit the whole or any part of any compensation paid by the Telegraph authority, from the person who has received the same.

17. (1) When, under the foregoing provisions of this Act, a telegraph line or post has been placed by the Telegraph authority under, over, along, across, in or upon any property not being properly vested in or under the control or management of a local authority, and any person entitled to do so, desires to deal with that property in such a manner as to render it necessary or convenient that the telegraph line or post should be removed to another part thereof or to a higher or lower level or altered in form, he may require the Telegraph authority to remove or alter the line or post accordingly

Provided that, if compensation has been paid under section 10, clause (d), he shall, when making the requisition, tender to the Telegraph authority the amount requisite to defray the expense of the removal or alteration, or half of the amount paid as compensation, whichever may be the smaller sum.

(2) If the Telegraph authority omits to comply with the requisition the person making it may apply to the District Magistrate within whose jurisdiction the property is situate to order the removal or alteration.

(3) A District Magistrate receiving an application under sub-section (2) may, in his discretion, reject the same or make an order, absolutely on subject to conditions, for the removal of the telegraph line or post to any other part of the property or to a higher or lower level or for the alteration of its form; and the order so made shall be final.

PROVISIONS APPLICABLE TO ALL PROPERTY.

18. (1) If any tree standing or lying near a telegraph line interrupts, or is likely to interrupt, telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, cause the tree to be removed or dealt with in such other way as he deems fit.

(2) When disposing of an application under sub-section (1), the Magistrate shall, in the case of any tree in existence before the telegraph line was placed, award to the persons interested in the tree such compensation as he thinks reasonable, and the award shall be final.

19. Every telegraph line or post placed before the passing of this Act under, over, along, across, in or upon any property, for the purposes of a telegraph established or maintained by the Government, shall be deemed to have been placed in exercise of the powers conferred by, and after observance of all the requirements of, this Act.

19A. (1) Any person desiring to deal in the legal exercise of a right with any property in such a manner as is likely to cause damage to a telegraph line or post which has been duly placed in accordance with the provisions of this Act, or to interrupt or interfere with telegraphic communication, shall give not less than one month's notice in writing of the intended exercise of such right to the Telegraph authority, or to any Telegraph officer whom the telegraph authority may empower in this behalf.

(2) If any such person without having complied with the provisions of sub-section (1) deals with any property in such a manner as is likely to cause damage to any telegraph line or post, or to interrupt or interfere with telegraphic communication, a Magistrate of the first or second class may, on the application of the Telegraph authority, order such person to abstain from dealing with such property in such manner for a period of not exceeding one month from the date of his order, and forthwith to take such action with regard to such property as may be, in the opinion of the Magistrate, necessary, to remedy or prevent such damage, interruption or interference during such period.

(3) A person dealing with any property in the manner referred to in sub-section (1) with the *bona fide* intention of averting imminent danger of personal injury to himself or other human being shall be deemed to have complied with the provisions of the said sub-section if he gives notice of the intended exercise of the right as is in the circumstances possible, or where no such previous notice can be given without incurring the imminent danger referred to above,

if he forthwith gives notice of the actual exercise of such right to the authority or officer specified in the said sub-section.

19B. The Governor-General in Council may, by notification in the *Gazette of India*, confer upon any licensee under section 4, in respect of the extent of his licence and subject to any conditions and restrictions which the Governor-General in Council may think fit to impose and to the provisions of this Part, all or any of the powers which the Telegraph authority possesses under this Part with regard to a telegraph established or maintained by the Government or to be so established or maintained:

Provided that the notice prescribed in section 19A shall always be given to the Telegraph authority or officer empowered to receive notice under section 19A (1).

PART IV.—PENALTIES.

20. (1) If any person establishes, maintains or works a telegraph within British India in contravention of the provisions of section 4 or otherwise than as permitted by rules made under that section, he shall be punished, if the telegraph is a wireless telegraph with imprisonment which may extend to three years or with fine, or with both, and, in any other case, with a fine which may extend to one thousand rupees.

(2) Notwithstanding anything contained in the Code of Criminal Procedure, 1898, offences under this section in respect of a wireless telegraph shall, for the purposes of the said code, be bailable and non-cognizable.

(3) When any person is convicted of an offence punishable under this section, the Court before which he is convicted may direct that the telegraph in respect of which the offence has been committed, or any part of such telegraph be forfeited to His Majesty.

20A. If the holder of a licence granted under section 4 contravenes any condition contained in his licence, he shall be punished with fine which may extend to one thousand rupees and with a further fine which may extend to five hundred rupees for every week during which the breach of the conditions continues.

21. If any person, knowing or having reason to believe that a telegraph has been established or is maintained or worked in contravention of this Act, transmits or receives any message by such telegraph, or performs any service incidental thereto, or delivers any message for transmission by such telegraph, or accepts delivery of any message sent thereby, he shall be punished with fine which may extend to fifty rupees.

22. If a railway company, or an officer of a railway company, neglects or refuses to comply with the provisions of section 6, it or he shall be punished with fine which may extend to one thousand rupees for every day during which the neglect or refusal continues.

23. If any person—

(a) Without permission of competent authority enters the signal room of a Telegraph office of the Government, or of a person licensed under this Act, or

(b) Enters a fenced enclosure round such a Telegraph office in contravention of any rule or notice not to do so or

(c) Refuses to quit such room or enclosure on being requested to do so by any officer or servant employed therein, or

(d) Wilfully obstructs any such officer or servant in the performance of his duty, he shall be punished with fine which may extend to five hundred rupees.

24. If any person does any of the acts mentioned in section 23 with the intention of unlawfully learning the contents of any message, or of committing any offence punishable under this Act, he may (in addition to the fine with which he is punishable under section 23) be punished with imprisonment for a term which may extend to one year.

25. If any person, intending—

(a) To prevent or obstruct the transmission or delivery of any message, or

(b) To intercept or to acquaint himself with the contents of any message, or

(c) To commit mischief

damages, removes, tampers with or touches any battery, machinery, telegraph line, post or other thing whatever, being part of or used in or about any telegraph or in the working thereof, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

25A. If, in any case not provided for by section 25, any person deals with any property and thereby wilfully or negligently damages any telegraph line or post duly placed on such property in accordance with the provisions of this Act, he shall be liable to pay the Telegraph authority such expenses (if any) as may be incurred in making good such damage, and shall also, if the telegraphic communication is by reason of the damages so caused interrupted, be punishable with a fine which may extend to one thousand rupees:

Provided that the provisions of this section shall not apply where such damage or interruption is caused by a person dealing with any property in the legal exercise of a right if he has complied with the provisions of section 19A (1).

26. If any Telegraph officer, or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office—

(a) Wilfully secretes, makes away with or alters any message which he has received for transmission or delivery, or

(b) Wilfully, and otherwise than in obedience to an order of the Governor-General in Council or of a Local Government, or of an officer especially authorised by the Governor-General in Council to make the order, omits to transmit, or intercepts or detains any message or any part hereof, or otherwise than in pursuance of his official duty or in obedience to the direction of a competent Court, discloses the contents or any part of the contents of any message to any person not entitled to receive the same, or

(c) Divulges the purport of any telegraphic signal to any person not entitled to become acquainted with the same, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

27. If any Telegraph officer transmits by telegraph any message on which the charge prescribed by the Government, or by a person licensed under this Act, as the case may be, has not been paid, intending thereby to defraud the Government or that person, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

28. If any Telegraph officer or any person not being a Telegraph officer but having official duties connected with any office which is used as a Telegraph office, is guilty of any act of drunkenness, carelessness, or other misconduct

whereby the correct transmission or the delivery of any message is impeded or delayed, or if any Telegraph officer loiters or delays in the transmission or delivery of any message, he shall be punished with imprisonment for a term which may extend to three months, or with fine which may extend to one hundred rupees, or with both.

29. If any person transmits or causes to be transmitted by telegraph a message which he knows to be false or fabricated, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

29A. If any person, without due authority—

(a) Makes or issues any document of a nature reasonably calculated to cause it to be believed that the document has been issued by, or under the authority of, the Director-General of Posts and Telegraphs, or

(b) Makes on any documents any mark in imitation of or similar to, or purporting to be, any stamp or mark of any Telegraph office under the Director-General of Posts and Telegraphs, or a mark of a nature reasonably calculated to cause it to be believed that the document so marked has been issued by, or under the authority of, the Director-General of Posts and Telegraphs.

he shall be punished with fine which may extend to fifty rupees.

30. If any person fraudulently retains, or wilfully secretes, makes away with, or detains a message which ought to have been delivered to some other person, or, being required by a Telegraph officer to deliver up any such message, neglects or refuses to do so, he shall be punished with imprisonment for a term which may extend to two years, or with fine, or with both.

31. A Telegraph officer shall be deemed a public servant within the meaning of sections 161, 162, 163, 164 and 165 of the Indian Penal Code; and in the definition of "legal remuneration" contained in the said section 161, the word "Government" shall, for the purposes of this Act, be deemed to include a person licensed under this Act.

32. Whoever attempts to commit any offence punishable under this Act shall be punished with the punishment herein provided for the offence.

PART V.—SUPPLEMENTAL PROVISIONS.

33. (1) Whenever it appears to the Local Government that any act causing or likely to cause wrongful damage to any telegraph is repeatedly and maliciously committed in any place, and that the employment of an additional Police force in that place is thereby rendered necessary, the local Government may send such additional Police force as it thinks fit to the place and employ the same therein so long as in the opinion of that Government the necessity of doing so continues.

(2) The inhabitants of the place shall be charged with the cost of the additional Police force, and the District Magistrate shall, subject to the orders of the Local Government, assess the proportion in which the cost shall be paid by the inhabitants according to his judgment of their respective means.

(3) All moneys payable under sub-section (2) shall be recoverable either under the warrant of a Magistrate by distress and sale of the movable property of the defaulter within the local limits of his jurisdiction, or by suit in any competent Court.

(4) The Local Government may by order in writing define the limits of any place for the purposes of this section.

34* (1) This Act, in its application to the Presidency-towns, shall be read as if the words, "District Magistrate" in section 16, sub-section (1), and section 17, sub-sections (2) and (3), for the words "Magistrate of the first or second class" in section 18, sub-section (1), and section 19A, sub-section (2) and for the word "Magistrate" in section 18, sub-section (2), there had been enacted the words "Commissioner of Police," and for the words "District Judge" in section 16, sub-sections (3), (4) and (5), the words "Chief Judge of the Court of Small Causes."

(2) Section 16, in its application to the town of Rangoon, shall be read as if for the words "District Judge," wherever they occur in that section, there had been enacted the word "Judge of the Court of Small Causes."

(3) The fee in respect of an application to the Chief Judge of a Presidency Court of small Causes under sub-section (3) of section 16 shall be the same as would be payable under the Court-fees Act, 1870, in respect of such an application to a District Judge beyond the limits of a Presidency-town, and fees for summonses and other processes in proceedings before the Chief Judge under sub-section (3) or sub-section (4) of that section shall be payable according to the scale set forth in the fourth schedule to the Presidency Small Cause Courts Act, 1882.

NOTIFICATIONS UNDER THE SEA CUSTOMS ACT, 1878.

IMPORTATION OF APPARATUS FOR WIRELESS TELEGRAPHS INTO BRITISH INDIA.

B The bringing by sea or land into British India of any apparatus for wireless telegraphs is restricted by Notifications of the Government of India in the Department of Commerce, No. 6081 of the 22nd October, 1921, and No. 352, of the 21st January, 1922, to cases in which:—

(1) Such apparatus is imported by any person to whom a licence to establish, maintain and work a wireless telegraph has been granted under the first proviso to sub-section (1) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885); or

(2) A licence to import such apparatus has been granted by the Director-General of Posts and Telegraphs and in consideration of the grant of such licence a bond for such amount as may in each case be directed by the Director-General of Posts and Telegraphs, has been executed by the licensee.

FINANCE DEPARTMENT (CUSTOMS) NOTIFICATION No. 245, DATED THE 19TH MAY, 1923.

In exercise of the power conferred by section 23 of the Sea Customs Act, 1878 (VIII of 1878), the Governor-General in Council is pleased to exempt apparatus for wireless telegraphs imported in accordance with the terms of the notification of the Government of India in the Department of Commerce No. 6081, dated the 22nd October, 1921, from so much of the import duty leviable thereon under the Indian Tariff Act, 1894 (VIII of 1894), as is in excess of 2½ per cent. *ad valorem*.

*S. 34 was added by the Indian Telegraphs (Presidency Towns) Act, 1888 (XI of 1888), General Acts, Vol. IV.

RULES FOR THE CONDUCT OF WIRELESS TELEGRAPHS.

LICENSED UNDER THE INDIAN TELEGRAPH ACTS, 1885-1914.

(Indian Wireless Telegraphs Rules, 1921.)

POWER OF TELEGRAPH AUTHORITY TO GRANT LICENCES.

GOVERNMENT OF INDIA.—PUBLIC WORKS DEPARTMENT. No. 23 P.W.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

C In exercise of the powers conferred by sub-section (2) of section 4 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry, No. 4837-88, dated the 20th June, 1914, the Governor-General in Council is pleased to delegate to the telegraph authority the power to grant a licence to establish maintain or work a telegraph within any part of British India: Provided that every such licence shall be subject to the following conditions, namely:—

(1) That the telegraph shall be used solely for the transmission of unpaid messages relating to the business of the licence and in the case of a wireless telegraph licensed for research, experimental or instructional purposes that the telegraph is solely used for such purposes:

(2) That the telegraph authority may at any time take possession of the telegraph should he consider it necessary; and

(3) That the licence shall be revocable on the breach of any of the conditions therein specified.

GOVERNMENT OF INDIA.—PUBLIC WORKS DEPARTMENT. No. 24 P.W.

Notification.—Telegraphs.

Delhi, the 14th January, 1922.

In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the notification of the Government of India in the Department of Commerce and Industry No. 1984-P. & T., dated the 24th February, 1917, the Governor-General in Council is pleased to make the following rules regulating the conduct of wireless telegraphs established, maintained and worked by persons licensed under this Act:—

Short Title.—1. These rules may be called the Indian Wireless Telegraphs Rules, 1921.

Definitions.—2. In these rules, unless there is something repugnant in the subject or context—

(1) "Certificate of Competency" means a certificate of competency granted by the telegraph authority under these rules or by the proper authority in any British Possession or Protectorate entitling the holder to be employed as a wireless telegraph operator.

(2) "Convention" means the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and includes any modification of the said Convention or Regulations made from time to time.

(3) "Harbour" includes harbours, whether natural or artificial, estuaries, navigable rivers, piers, jetties and other works in or at which ships can obtain shelter, or ship or unship goods or passengers.

(4) "Service Signalling" means signalling by means of any system of wireless telegraph between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval Military or Air Force.

3. *Working of wireless telegraphs in ships within Indian territorial waters.*—Except with the general or special permission in writing of the telegraph authority no person shall work or use a wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is in any harbour in India.

4. No person shall send any message by means of the wireless telegraph in any ship (other than a British ship-of-war) whilst the ship is within Indian territorial waters when and where such messages can be forwarded by a Government telegraph.

5. No person shall work or use the wireless telegraph in any ship whilst the ship is within Indian territorial waters in such a way as to interrupt or interfere with service signalling or the transmission of messages between other wireless stations.

6. When communications are made by wireless telegraph between any ship within Indian territorial waters and a land station the rules given in the handbook, "*General Rules and Departmental Instructions for Radiotelegraph Stations in India*," shall be observed.

7. Nothing in these rules shall apply to the use of wireless telegraphs within Indian territorial waters for the purpose of making or answering signals of distress.

8. *Working of wireless telegraphs in aircraft over British India or over Indian territorial waters.*—Except with the general or special permission in writing of the Telegraph authority no person shall work or use a wireless telegraph in any aircraft (other than one of the Royal Air Force) whilst the aircraft is over British India or over Indian territorial waters, except in accordance with the following restrictions:—

(a) The wireless apparatus shall not be used except during actual flight or in case of forced landing;

(b) It may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

(i) Distress signals;

(ii) Meteorological information;

(iii) Forced landings and landing instructions;

(iv) Ascertaining or indicating position;

(v) Supply of fuel and spare parts;

(vi) Origin, destination or course of flight;

(c) The Aircraft Normal Wave (900 metres continuous wave) and no other wave shall be employed for the sending and receipt of messages to and from—

(i) Other aircraft stations;

(ii) Aviation stations;

(d) The aircraft Ship Wave (600 metres interrupted continuous wave) and no other wave shall be employed for the sending and receipt of—

(i) Messages to and from British Ships-of-war and all merchant ships;

(ii) Such messages as are rendered necessary by reason of exceptional emergency and do not come within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave;

(e) The rules given in the handbook "*General Rules and Departmental Instructions for Radiotelegraph Stations in India*" shall be observed;

(f) Service signalling or the transmission of messages between other wireless telegraph stations shall not be interfered with;

Provided that nothing in these restrictions shall apply to the use of wireless telegraphs for the purpose of making or answering signals of distress.

9. *Certificate of Competency.*—No person shall work the transmitting apparatus of a wireless telegraph in British India or in any ship or aircraft registered in British India unless he is a British subject or the subject of a State in India and holds a certificate of competency.

10. Certificates of competency shall be granted by the Telegraph authority subject to an examination, shall be in forms set out in the First and Second Schedules annexed hereto, shall indicate the system or systems in which the holder's examination was conducted, and shall certify that the holder—

(a) Is able to send and receive, by sound, messages in plain language in the International Morse Code and to send and receive speech clearly by wireless telephone apparatus, the speed at which Morse is to be sent and received being as follows (five letters being counted as one word):—

(i) *First Class.*—Not less than 20 words per minute.

(ii) *Second Class.*—12 to 19 words per minute.

(iii) *Third Class.*—Not less than 10 words per minute;

(b) Is able to adjust the apparatus ordinarily used so as to suit the varying conditions of working without using excessive power;

(c) Has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

11. Applications for permission to attend examinations for a certificate of competency shall be made to the Telegraph authority in the form shown in the Third Schedule to these rules. The date and place of examination will be notified to the candidate as soon as possible after the receipt of the application.

12. No person shall be eligible to attend an examination for a certificate of competency who is not a British subject, or the subject of a State in India.

13. Candidates for examination for first class certificates must be not less than 18 years of age.

14. The application form shall be forwarded to the examining officer by the Telegraph authority before the examination takes place.

15. Candidates for examination shall pay an examination fee of five rupees by means of postage stamps affixed to the application form.

16. *Scope of Examination.*—Candidates at an examination will be expected to—

(a) Send with an ordinary Morse key for five consecutive minutes at the prescribed speed. Accuracy and spacing will be taken into consideration;

(b) Receive and write down legibly for five consecutive minutes at the prescribed speed. A double headgear telephone receiver will be used for reception;

(c) Understand simple diagrams of the apparatus in which he is being examined and to make such diagrams from such apparatus

(d) Be able to connect up the apparatus; with the help of such diagrams so far as this is required in the system in which he is being examined;

(e) Name the parts of the apparatus and indicate their uses;

(f) Recognise, detect and remedy common faults in the apparatus;

(g) Adjust the apparatus as regards wavelength;

(h) Adjust the apparatus as regards power and generally regulate the transmitting gear and adjust the receiving gear;

(i) Answer questions on the method of handling radiotelegraphic traffic as set out in

the handbook issued by the telegraph authority. (*General Rules and Departmental Instructions for Radiotelegraph Stations in India*) and the Service Regulations attached to the Convention.

(j) Have a good working knowledge of secondary batteries and be able to identify the positive source of supply preparatory to placing a secondary battery on charge, and also to be able to place a secondary battery on charge or on discharge at its normal rate through a water resistance.

17. *Declaration to observe secrecy.*—If the candidate passes the examination he shall make a declaration before the examining officer that he will observe the secrecy of correspondence which comes to his knowledge in the course of duty.

18. (1) *Photograph of Candidate.*—A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.). This will be checked by the examining officer.

(2) If the candidate is successful in the examination he will sign the photograph in the presence of the examining officer. The examining officer will attach it to the candidate's application form, and return both to the telegraph authority.

(3) The photograph will be affixed to the back of the certificate of competency in the office of the telegraph authority and stamped with a special date stamp overlapping photograph and certificate.

(4) The certificate will be completed and sent to the candidate by post.

19. *Failure.*—In case of failure at an examination the candidate will not be re-examined until after the lapse of three months. An additional fee of five rupees shall be payable in respect of such re-examination.

20. (1) *Power of the telegraph authority to endorse, suspend or cancel certificate.*—Should the holder of a certificate of competency be proved to the satisfaction of the Telegraph authority wilfully or negligently to have failed to comply with the provisions of the Convention or any other regulations which may be issued from time to time for his guidance the Telegraph authority may endorse, suspend or cancel the certificate.

(2) The Telegraph authority may require the holder of a certificate of competency to produce the same for action under sub-rule (1), and the holder shall comply with such requisition.

FIRST SCHEDULE.

(See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

1st and 2nd Class.—*Wireless Telegraphs (including Telephone).*

This is to certify that under the provisions of the Radiotelegraph Convention, 1912, Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than _____ words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date _____ 192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a _____ class operator.

Signature.

Director-General of Posts and Telegraphs, India.

Date _____ 192

Signature of Holder

Date of Birth

Place of Birth

Description and Photograph of Holder,

Height _____ feet _____ inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of the holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

SECOND SCHEDULE.

(See Rule 10.)

CERTIFICATE OF COMPETENCY AS WIRELESS OPERATOR.

3rd Class.—*Wireless Telephone.*

This is to certify that Mr. _____ has been examined in radiotelegraphy and has passed in:—

(a) The working and adjustment of apparatus.

(b) Transmission and sound reading (Morse Code) at a speed of not less than ten words per minute, and transmission and reception of speech.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph traffic.

2. The holder's practical knowledge was tested on a set of apparatus.*

His knowledge of other systems is as follows:—

3. It is also certified hereby that the holder has made a declaration that he will preserve the secrecy of correspondence.

Signature of Examining Officer

Date _____ 192

The holder of this certificate is therefore authorised to operate radiotelegraph apparatus as a third class operator.

*It is not intended to limit the employment of the holder to a particular system, but merely to indicate the particular system in which he was tested for adjustment of apparatus.

Signature
Director-General of Posts and Telegraphs,
India.
Date 192

Signature of Holder.
Date of Birth. Place of Birth.
Description and Photograph of Holder.

Height feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

N.B.—This certificate may be endorsed, suspended or cancelled at the discretion of the Director-General of Posts and Telegraphs, in the case of misconduct or breach of the regulations on the part of holder.

Two rupees will be charged for each duplicate copy of this certificate in cases in which the loss is due to unavoidable accident. In all other cases the following charges will be made for duplicate copies of this certificate:—

Four rupees on the first occasion.

Eight rupees on the second occasion.

Sixteen rupees on the third or subsequent occasions.

In cases of gross carelessness the question of withholding the issue of a duplicate copy of this certificate will be considered.

THIRD SCHEDULE.

(See Rule II.)

APPLICATION TO ATTEND EXAMINATION FOR
CERTIFICATE OF COMPETENCY AS WIRELESS
OPERATOR.

(Postage stamps or stamp to the value of five rupees to be affixed here.)

To
THE DIRECTOR-GENERAL OF POSTS AND
TELEGRAPHS,
(Wireless Branch), INDIA.

Sir,—I beg to inform you that I wish to obtain a certificate qualifying me to act as Wireless Telegraph Operator. I declare that I am a British subject or subject of a State in India.

I am, Sir,
Your obedient servant,

Signature
Date 192

Name in full.
Date of Birth. Place of Birth.

Address to which it is desired that the order for examination shall be sent

System or systems in which examination is desired*

Place at which the candidate would prefer to be examined*

Description of Candidate.

Height. feet inches.

Colour of eyes.

Colour of hair.

Complexion.

Any special peculiarities or marks.

*Every endeavour will be made to meet the convenience of candidates in this respect, but no assurance can be given that the examination will be held at the place specified.

A candidate presenting himself for examination shall provide an unmounted photograph (approximately 2 ins. by 3 ins.) before his examinations. This will be checked by the Examining Officer.

RULES FOR THE CONDUCT OF WIRELESS TELEGRAPHS.

WHEN EMPLOYED FOR PUBLIC CORRESPONDENCE BETWEEN COAST STATIONS IN BRITISH INDIA AND SHIPS AT SEA.
GOVERNMENT OF INDIA.—PUBLIC WORKS
DEPARTMENT.—No. 1386—P.W.

Notifications.—Telegraphs.

Simla, the 22nd July, 1922.

No. 1386-P.W.—In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (XIII of 1885), and in supersession of the Notification of the Government of India in the Department of Commerce and Industry, No. 10054-87, dated the 29th November, 1913, the Governor-General in Council is pleased to issue the following rules governing the exchange by radiotelegraph of public correspondence between coast stations in British India and ships.

DURATION OF SERVICE.

1. The service at coast stations in British India will be in accordance with the hours notified for such stations in the "International List of Radiotelegraph Stations."

FORM AND ACCEPTANCE OF TELEGRAMS.

2. The form and acceptance of telegrams will be in accordance with the rules for Foreign telegrams as given in the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137 dated the 16th September, 1919.

SPECIAL RULES FOR RADIOTELEGRAMS.

3. The sender is in every case responsible for the sufficiency and accuracy of the address of his radio-telegram.

4. (1) The address of radio-telegrams intended for ships should be drawn up as follows:—

(i) Name or description of addressee, with supplementary particulars, if necessary.

(ii) Name of the ship as in the first column of the "International List of Radiotelegraph Stations"; and,

(iii) If intended to be transmitted through a coast station, the name of the coast station as it appears in the "International List of Radiotelegraph Stations."

(2) If desired, the name of the ship may, at the risk of the sender, be replaced by the particulars of its voyage.

5. In the case of radiotelegrams accepted on board ship for places on land it is the duty of the operator to see that the office of destination is written as shown in the first column of the "International List of Telegraph Offices."

SPECIAL RULES FOR RADIOTELEGRAMS.

6. The name and permanent address of the sender of a radiotelegram should be written on the form for purposes of record.

PREAMBLE.

7. The preamble of every radiotelegram will begin with the word "Radio."

8. On transmitting a radiotelegram from a ship over the ordinary telegraph system, the coast station will insert for "office of origin" the name of the ship of origin as it appears in the "International List of Radiotelegraph Stations," and also, when the case arises, the name of the last ship which acted as intermediary should any re-transmission have occurred, and the name of the coast station. The code time (*i.e.*, the time of receipt of the radiotelegram at the coast station) will also be inserted, and this, together with the service instructions, the date and time of handing in, and the number of words signalled by the ship will be transmitted

CHARGES FOR RADIOTELEGRAMS.

9. The charge for a radiotelegram must in every case be prepaid by the sender.

10. The coast station charge and the ship station charge are notified in the "International List of Radiotelegraph Stations"; and such charges as are fixed from time to time as far as British India is concerned, are published in the Post and Telegraph Guide.

RADIOTELEGRAMS FOR DELIVERY BY POST FROM A PORT OF CALL OF THE SHIP TO WHICH THEY ARE TRANSMITTED.

11. (1) Radiotelegrams may be accepted for a ship with the object of being forwarded by post from a port of call. Re-transmission by radiotelegraphy is not permitted in such cases.

(2) The address must be drawn up as follows:

(a) The paid instruction "Poste" followed by the name of the port where the radiotelegram is to be posted.

(b) Name and address of the addressee.

(c) Name of the ship station which is to carry out the posting.

(d) Name of the coast station in communication with the ship, unless the message is exchanged directly between two ships.

Example:—

"= Poste Bombay = Smith 14 The Mall
Poona Mantua Karachi Radio."

(3) A charge for postage equivalent to 25 gold centimes at the rate of exchange from time to time fixed by the Governor-General in Council shall be payable by the sender in addition to the radiotelegraph charges.

(4) A radiotelegram of this nature received on board a ship will be posted as a paid letter at the port indicated and particulars of posting noted on the duplicate form.

CLASSES OF TELEGRAMS NOT ADMITTED IN THE RADIOTELEGRAPHIC SERVICE.

12. Certain special classes of telegrams, which are admitted in the international telegraph service, cannot be accepted in the radiotelegraphic service. They are as follows:—

(a) Telegraphic money orders.

(b) Telegrams "to follow the addressee."

(c) Paid service telegrams asking for repetition of information, except as regards transmission over the ordinary telegraph system.

(d) Urgent telegrams, except as regards transmission over the telegraph system of Administrations which accept such telegrams.

(e) Telegrams at deferred rates.

PRIORITY OF MESSAGES.

13. Subject to the proviso that signals of distress shall take precedence over all other messages, radiotelegrams shall be transmitted in the order given in Rule 158 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, viz.:—

(a) State (or Government) telegrams.

(b) Service telegrams.

(c) Private telegrams.

(d) Press telegrams.

UNDELIVERED RADIOTELEGRAMS FROM SHIPS.

14. When a radiotelegram from a ship at sea cannot be delivered to the addressee on land, the fact, with the reason assigned for the non-delivery, will be communicated to the ship for the information of the sender. If the sender is desirous of altering or adding to an address, he may do so by means of a paid service advice.

UNDELIVERED RADIOTELEGRAMS ADDRESSED TO SHIPS.

15. When a radiotelegram reaching a ship

at sea cannot be delivered, the office or ship station of origin will be informed by service advice.

16. (1) The sender of a radiotelegram to a ship may indicate the maximum period for which he desires the message to be kept at the coast station.

(2) If the sender does not specify any period, the office of origin will be informed by service advice on the morning of the 8th day after the despatch of the radiotelegram that it has not been possible to deliver the message to the ship of destination. The sender, who will be informed by the office of origin, may then, if he chooses, request, by means of a paid service advice to the coast station (the prepayment being at the rate for a message to the coast station, without payment of the wireless rate either for the coast station or for the ship), that the radiotelegram may be retained for a further period of 9 days, and so on. If no such request is received, the radiotelegram shall be treated as undeliverable at the end of the 9th day, not including the day of handing in.

(3) If the coast station knows that the ship has passed beyond its range of transmission before the radiotelegram could be transmitted to it, the office of origin shall be informed accordingly by service advice without delay for intimation to the sender, who may then, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

MESSAGE FORMS TO BE PRESERVED.

17. The originals of radiotelegrams and the documents relating to them shall be kept for seven days only in Government telegraph and radiotelegraph offices, after which they shall be sent to the Deputy Accountant-General, Telegraph Check Office, Calcutta, where they shall be preserved for at least fifteen months, reckoned from the month following that of handing in.

REFUNDS.

18. Refunds shall be governed by Rules 348 to 358 of the rules published in the Notification of the Government of India in the Department of Commerce and Industry, No. 6975-137, dated the 16th September, 1909, subject to the following conditions:—

(a) No refund shall be granted in respect of any radiotelegram inadmissible under Rule 12 of these rules;

(b) The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

(c) If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the coast station and ship station charges in respect of such radiotelegram shall be refunded to the sender.

EXTRACTS FROM THE INDIAN MERCHANT SHIPPING ACT, 1923, AND NOTIFICATIONS.

(Act No. XXI of 1923*)

*This Act repeals the Indian Wireless Telegraphy (Shipping) Act, 1920 (XLI of 1920).

D An Act to consolidate certain enactments relating to Merchant Shipping. Whereas it is expedient to consolidate certain enactments relating to Merchant Shipping, it is hereby enacted as follows:—

PART I.

INTRODUCTORY.

1. (1) This Act may be called the Indian Merchant Shipping Act, 1923.

(2) It shall come into force on such date as the Governor-General in Council may, by notification in the *Gazette of India*, appoint.

2. *Definitions*.—In this Act, unless there is anything repugnant in the subject or context,—

(4) "Master" includes every person (except a pilot or harbour master) having command or charge of a ship;

(6) "Passenger" includes any person carried in a ship other than the master and crew and the owner, his family and servants;

(7) "Prescribed" means prescribed by rules made under this Act;

(9) "Steam-ship" means every description of vessel used in navigation and propelled wholly or partly by the agency of steam;

3. The provisions of this Act applying to steamships shall apply to ships propelled by electricity or other mechanical power, with such modifications as the Governor-General in Council may, by notification in the *Gazette of India*, direct for the purpose of adaptation.

4. This Act shall not, except where specially provided, apply to ships belonging to His Majesty or the Government, or to ships belonging to any foreign Prince or State and employed otherwise than for profit in the public service of that foreign Prince or State.

PART V.

SAFETY.

INSTALLATION OF WIRELESS TELEGRAPHY.

240. The provisions of this Part in regard to the installation of wireless telegraphy on ships registered in British India shall come into force on such date as the Governor-General in Council may, by notification in the *Gazette of India*, direct.

241. In the provisions of this Part relating to the installation of wireless telegraphy, "passenger steamer" means a steamship which carries more than twelve passengers.

242. (1) Every sea-going British ship registered in British India, being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation of the prescribed description and shall maintain a wireless telegraph service of the prescribed nature and shall be provided with such certificated operators and watchers as may be prescribed:

Provided that the Governor-General in Council may, by notification in the *Gazette of India*, exempt from the obligations imposed by this Section any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph installation is unnecessary or unreasonable.

(2) If this section is not complied with in the case of any such ship, the master or owner of the ship shall be punishable in respect of each offence with a fine which may extend to one thousand rupees.

243. (1) The Governor-General in Council may appoint officers (hereinafter referred to as wireless telegraphy inspectors) for the purpose of seeing that the requirements of this Part relating to wireless telegraphy are complied with on board any ship.

(2) A wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certificated operators and watchers in conformity with this Part and for this purpose may go on board any ship at all reasonable times and do all things necessary for the proper inspection of the ship for the purpose of this Part and may also require the master of the ship to supply him with any information which it is in the power of the master to supply for that purpose, including the production of any certificate granted under this Part in respect of the installation, and of the certificates of the operators and watchers on the ship.

(3) If a wireless telegraphy inspector finds that a ship is not provided, he shall give to the master or owner notice in writing pointing out the deficiency; and also pointing out what in his opinion is requisite to remedy the same.

(4) Every notice given under sub-section (3) shall be communicated, in the prescribed manner, to the Chief Officer of Customs of any port at which the ship may seek to obtain port-clearance, who shall order that the ship shall be detained until a certificate under the hand of a wireless telegraphy inspector is produced to the effect that the ship is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Part.

244. The provisions of this Part relating to wireless telegraphy shall, as from a date three months after the coming into force of those provisions, apply to ships other than British ships registered in British India while they are within any port in British India in like manner as they apply to British ships registered in British India.

245. (1) The Governor-General in Council may make rules to carry out the purposes of this Part relating to wireless telegraphy.

(2) In particular and without prejudice to the generality of the foregoing power such rules may prescribe—

(a) The nature of the wireless telegraph installation to be provided and of the service to be maintained, and the number, grades and qualifications of certified operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator, unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914:

(b) The manner in which a notice given under sub-section (3) of section 243 shall be communicated to the Chief Officer of Customs.

PART VIII.

LEGAL PROCEEDINGS.

280. The following persons shall be deemed to be public servants within the meaning of the Indian Penal Code, namely:—

(f) Every Wireless Telegraphy Inspector appointed under this Act.

PART IX.

SUPPLEMENTAL.

294. All rules made under this Act shall be published in the *Gazette of India* or the local official *Gazette*, as the case may be, and such publication shall have effect as if in this Act.

295. No suit or other legal proceeding shall lie against any person for anything which is in good faith done or intended to be done under this Act.

GOVERNMENT OF INDIA.—DEPARTMENT OF COMMERCE.

NOTIFICATIONS.—MERCHANT SHIPPING.

Simla, the 5th May, 1923.

No. 2743.—In pursuance of section 240 of the Indian Merchant Shipping Act, 1923 (XXI of 1923), the Governor-General in Council is pleased to direct that the provisions of sections 241 to 245 of the said Act shall come into force on the 5th May, 1923.

No. 2744.—In exercise of the power conferred by the proviso to sub-section (1) of section 242 of the Indian Merchant Shipping Act, 1923, the Governor-General in Council is pleased to exempt from the obligations imposed by the said Act *all ships engaged in the coasting trade except ships engaged in the following runs, namely:—*

- (1) Calcutta to Rangoon.
- (2) " " Port Blair.
- (3) " " Penang.
- (4) " " Colombo.
- (5) Madras ports to Rangoon.
- (6) " " Port Blair.
- (7) " " Penang.
- (8) Rangoon to Calcutta.
- (9) " " Port Blair.
- (10) " " Penang.
- (11) Bombay to Aden.
- (12) " " Karachi direct
- (13) Ports in British India to Singapore.

Explanation—"Coasting trade" means trade exclusively carried on between the ports specified in the definition of "home-trade ship" in section 2 of the Indian Merchant Shipping Act, 1923.

No. 2745.—In exercise of the power conferred by section 245 of the Indian Merchant Shipping Act, 1923 (XXI of 1923), the Governor-General in Council is pleased to make the following rules—

1. *Short title*.—These rules may be called the Indian Wireless Telegraphy (Shipping) Rules, 1923.

2. *Definition*.—In these rules, unless there is anything repugnant in the subject or context—

"Coasting trade" means trade exclusively carried on between the ports specified in the definition of "home-trade ship" in section 2 of the Indian Merchant Shipping Act, 1923.

"Number of hours occupied in a voyage from port to port" means the normal number of hours occupied in a voyage between one port of call and the next. In the case of river ports the duration of the voyage shall count from pilot ground to pilot ground.

"The Act" means the Indian Merchant Shipping Act, 1923.

3. *Classification of Ships*.—For the purpose of these rules ships shall be classified as follows:

Class I. Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II. Ships not engaged in the coasting trade carrying not less than 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III. Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

4. *Installation to comply with requirements of Radiotelegraph Convention, 1912*.—The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement or of any international agreement by which the said Convention of 1912 may be superseded.

5. *Nature of Installation*.—The installation shall be of the spark or interrupted continuous wave type.

6. (1) *Installation to consist of a normal and an emergency installation except in certain cases*.—The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as with those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly, and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) At least once during each outward and homeward voyage the emergency installation shall be tested by the exchange of signals with another ship station or with a coast station. Particulars of such tests shall be entered in the log as they occur; the entry shall also indicate the distance over which signals were exchanged together with remarks on the efficient working or otherwise of the installation.

7. *Means of communication to be provided between the bridge and wireless telegraph room*.—There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means, and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

8. *Requirements to be complied with by ships not fitted with automatic apparatus*.—If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch—

Nature of Voyage.	Number and Grade of Operators.
(a) Voyage exceeding 48 hours from port to port.	Three operators of whom one shall hold a First Grade certificate and not more than one a Third Grade certificate.
(b) Voyage exceeding 8 hours, but not exceeding 48 hours from port to port.	Two operators, of whom one shall hold a First or a Second Grade certificate.

(c) Voyage not exceeding 8 hours from port to port. One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in Schedule A to these rules, and either a certificated operator or a certificated watcher shall always be on watch at other times—

Nature of Voyage.	Number and Grade of Operators and Watchers.
-------------------	---

(a) Voyage exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and two watchers.
--	--

b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and one watcher.
---	---

(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.
---	--

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in Schedule A to these rules.

9. *Ships of Class III to be fitted with approved automatic apparatus.*—In the event of an automatic apparatus for registering the signal of distress being approved by the Governor-General in Council a ship of Class III shall be fitted with such apparatus unless the ship is employed on voyages on which normally not more than 8 hours are taken to get from one port of call to the next, but in such a case the operator shall be on watch during the whole time of the voyage.

10. *Requirements to be complied with by ships fitted with automatic apparatus.*—If fitted with automatic apparatus for registering the signal of distress approved as aforesaid—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall always be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus—

Nature of Voyage.	Number and Grade of Operators.
-------------------	--------------------------------

(a) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a First Grade certificate.
--	--

(b) Voyage not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.
--	--

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator, who shall hold a First or a Second grade certificate, and while at sea the operator shall be on watch during the times specified in Schedule A to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus:

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor-General in Council, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in Schedule A to these rules.

11. *Qualifications of Operators.*—(1) Operators shall be granted First, Second or Third Grade certificates in accordance with general or special orders of the Governor-General in Council in this behalf, and watchers shall be certificated by the Director-General of Posts and Telegraphs.

(2) Until certificates are granted in accordance with such orders as aforesaid:—

(i) An operator who holds a First Class certificate of competency granted by the Director-General of Posts and Telegraphs and who has had three years' experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds a First or Second Class certificate of competency granted by the Director-General of Posts and Telegraphs and who has had one year's experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a Second Grade certificate.

(iii) An operator who holds a First or Second Class certificate of competency granted by the Director-General of Posts and Telegraphs, and who has had less than one year's experience at sea as a commercial operator in a vessel of the mercantile marine may be employed as if he held a Third Grade certificate.

12. *Discretion to accept certificates granted in other countries.*—A certificate granted to an operator by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force may be accepted for the purpose of these rules as equivalent to a certificate of such grade as the Director-General of Posts and Telegraphs may think fit by general or special order to direct.

13. *Manner in which notice should be given to the Chief Officer of Customs.*—The notice required to be given under sub-section 3 of section 243 of the Act shall be in the Form in Schedule B to these rules, and a copy of every such notice shall on the same day be forwarded by the Wireless Telegraphy Inspector issuing the notice to the Chief Officer of Customs at the port concerned.

SCHEDULE A.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° East	from 4 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 14 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

SCHEDULE B.

Posts and Telegraph Department.

Captain

Port of

Date

Sir,

An inspection made this day of the wireless telegraph installation on board the s.s. of which you are master, indicates that the equipment does not conform to the requirements of the Indian Merchant Shipping Act, 1923, and the licence issued by the Director-General, Posts and Telegraphs, in the following particulars.

I am of opinion that the following steps should be taken to remedy the deficiencies

Copies of this report have been forwarded to the Chief Officer of Customs at

Wireless Inspector.

No. 3563.—In exercise of the power conferred by section 245 of the Indian Merchant Shipping Act, 1923 (XXI of 1923), the Governor-General in Council is pleased to direct that the following amendment shall be made in the Indian Wireless Telegraphy (Shipping) Rules, 1923, namely:—

After sub-rule (2) of rule 11 of the said rules, the following sub-rule shall be inserted, namely:

“(3) For the purposes of sub-rule (2) experience as an operator in the Royal Navy or Royal Indian Marine or in seaplanes of the

Royal Air Force may be accepted in substitution for experience at sea as a commercial operator in a vessel of the mercantile marine in respect of a period which for the purposes of clause (i) of the said sub-rule shall not exceed two years and for the purposes of clause (ii) or clause (iii) of the said sub-rule shall not exceed six months of the total period of experience required.”

POST AND TELEGRAPHS.

GENERAL INSTRUCTIONS

GOVERNING LICENCES FOR WIRELESS TELEGRAPHS IN BRITISH INDIA.

Published by Order of the Director-General of Posts and Telegraphs.

Except in the case of wireless telegraphs owned or worked by Government for which no licence is required, no person may:—

(a) import by sea or by land apparatus for wireless telegraphs into British India; or
(b) establish, maintain or work a wireless telegraph in any place in British India, or in any ship or aircraft registered in British India;
except under a licence granted by the Director-

General on behalf of the Governor-General in Council.

2. Licences will be granted by the Director-General in such forms as are prescribed under the classification laid down in the following table:—

Form of Licence.	Type of Station.	Class.	Apparatus permitted.	Class of Operator required.	Purpose.
Import	—	—	T R M S	—	Importation of apparatus for wireless telegraphs into British India.
Fixed Stations*	Limited-Commercial.	I	T R M S	2nd	Transmission and Reception for business purposes.
		II	T R S	3rd	
		III	R M S	Nil.	
	Non-Commercial.	I	T R M S	3rd	Reception only for business purposes.
		II	R M S	Nil.	
		III	T R (a)	Nil.	
Mobile Stations	Ship	I, II, III	T R M S	1st and 2nd	Bona fide experimenters, experimental and instructional establishments and amateurs.
	Aircraft	—	T R M S	(b) 1st and 2nd	

T = Transmission. R = Reception. M = Morse. S = Speech.

(a) No antenna to be used.

(b) According to International Radiotelegraph Convention.

Note.—The term "Wireless Telegraphs" includes Wireless Telephony.

* Spark not permitted for Fixed Stations. Power normally limited to 100 watts.

3. No applications for fixed station licences will be considered by the Director-General unless they are accompanied by the approval of the Local Government of the Province in which it is proposed to install the licensed apparatus. The Director-General will not grant a licence unless he is satisfied:—

(a) That the applicant is not less than 21 years of age and a British subject or a subject of an Indian State and has furnished satisfactory evidence as to character and the objects for which he requires a licence. Applications from *bona fide* experimenters between the ages of 16 and 21 will be considered if accompanied by a declaration from the head of the educational establishment attended by the applicant or from his legal guardian that the applicant is a fit and proper person interested in and competent to conduct experiments in wireless telegraphs.

(b) That the applicant has in view some definite object of scientific value or general public utility. If scientific research is intended the applicant should be certified as a competent investigator by a Government Department or some recognised scientific body.

(c) That the applicant can show that he is, or the persons he proposes to employ are, capable of working the apparatus for the objects for which he requires a licence.

(d) That if the apparatus is to be used for the transmission of messages or signals using an antenna, the applicant undertakes to employ in this work only certified operators of the number and class required.

(e) That the apparatus is capable of being worked in accordance with the provisions of the licence.

4. Duration of Licences.—(1) All licences will be valid for one year commencing on January 1st and expiring on December 31st. All licences issued during the year automatically expire on December 31st.

(2) Applications for renewal must be forwarded so as to reach the Director-General by December 1st in each year.

(3) The renewal may be made at any time within one month before or one month after the date of expiry of the licence.

5. Fee.—The fee for all licences is Rs. 10 per annum in respect of each station licensed and for each import licence. The fee is payable before the licence is issued and the fee payable upon renewal is payable before such renewal. It should be paid by postage stamps affixed to the application form or application for renewal.

6. Royalty.—(1) No royalty is charged in respect of fixed (non-commercial) and mobile stations.

(2) In the case of fixed (limited-commercial) stations an annual royalty is payable for each station licensed as under:—

Mode of Communication	Licensed to work during 24 hours daily.	Licensed to work during 16 hours daily.	Licensed to work during 8 hours daily.
Telegraph only	Rs. 440	Rs. 300	Rs. 150
Telephony, or Telephony & Telegraphy	550	370	190

In certain cases if the stations are erected outside the delivery radius of a Government Telegraph Office (usually 5 miles), the royalty may be reduced by an amount not exceeding 50 per cent.

7. Application for Licence and Renewal.—

(1) The application for a licence for a fixed or mobile station must be in the form shown in the first or second schedule annexed. Application

forms may be obtained on application to the Director-General of Posts and Telegraphs (Wireless Branch), Simla.

(2) Before granting the licence the Director-General may require the applicant to furnish such additional particulars as he thinks necessary.

(3) Every licence will be made out in triplicate. Two parts will be issued to the licensee and one part retained by the Director-General.

(4) The application for renewal of a licence must be in writing and should state the registered numbers of the licence and schedule or schedules and the period for which a renewal is desired. The renewal fee should be paid by postage stamps affixed to the application, which should be accompanied by the signed original licence.

(5) A licence will be renewed by an endorsement thereon or attachment thereto of a certificate signed by or on behalf of the Director-General.

FIRST SCHEDULE.

APPLICATION FOR LICENCE TO ESTABLISH, MAINTAIN AND WORK WIRELESS TELEGRAPHS IN BRITISH INDIA.

1. Name of applicant (in full)

Address
Age
Occupation

2. Is the applicant a British subject or subject of an Indian State? (Evidence of nationality and two written references as to character should be enclosed.)

3. Scientific qualifications (if any) of applicant. Particulars of any experience in working wireless telegraph apparatus.

Particulars of any certificates of competency held by applicant.

Speed at which applicant can send and receive in the Morse code.

4. Purpose for which a licence is required.

5. *Particulars of apparatus to be used. (Diagrams to be furnished and attached to this form.)

(a) Transmitting—

(b) Receiving—

(c) Antenna, including sketch and dimensions—

6. *Power to be used for transmission (A).

(a) Source (B)

(b) Point where measured

(c) Volts Amperes

7. *Particulars of Stations.

(d) D/C or A/C.

(e) Cycles per second A/C.

(f) Maximum watts to be taken by transmitting instruments.

Name.	Exact Location (a).	Type (b).	Class (b).	Remarks.

NOTES.—(a) If station is to be movable state place in which it will normally be located and area over which it is desired to move.

(b) For "Type" and "Class" see Table.

8. *Wavelengths it is desired to use:—

Transmitting.—Normal Metres

Additional "

Receiving.—Normal "

Additional "

9. *Range of waves over which apparatus is capable of being adjusted:—

Transmitting.— Metres

Receiving.— "

10. *Stations with which it is desired to communicate.

11. *What messages from Government stations it is desired to read and make use of?

12. *Hours of working desired (I.S.T.):—

Transmitting.

Receiving.

13. If the station or stations are intended to transmit, state names, addresses and qualifications of operators.

DECLARATION.

I undertake to observe the conditions of the licence and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the licence. I further declare that if the apparatus is licensed

* If more than one station is desired, details must be given for each station.

for the transmission of messages, only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant.

Date 192

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless Branch), Simla, through The Local Government of the province in which the station will be located.

Postage
Stamps

*If more than one station is desired, details must be given for each station

(A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.

(B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available and if supply mains state voltage, (whether direct or alternating) and periodicity.

SECOND SCHEDULE.

APPLICATION FOR LICENCE TO ESTABLISH, MAINTAIN AND WORK WIRELESS TELEGRAPHS IN SHIPS AND AIRCRAFT REGISTERED IN BRITISH INDIA.

1. Name of applicant (in full)

Address

Age

Occupation

2. Is the applicant a British subject or subject of an Indian State? (Evidence of nationality and two written references as to character should be enclosed.)

3. Particulars of Ship for which a licence is required :—

Name.	Owners.	Port of Registry.

4. Particulars of Aircraft for which a licence is required :—

Name and/or No.	Type and Make.	Registered Marking.	Place of Registry.

5. Particulars of apparatus :—

(a) Transmitting.

(b) Receiving.

(c) If emergency set is installed.

6. Power to be used for transmission (A) :—

(a) Source (B)

(b) Point where measured

(c) Volts Amperes

(d) D/C or A/C

(e) Cycles per second A/C.

(f) Maximum watts to be taken by transmitting instruments.

(A) Power is defined in the case of valve transmission as the power in the anode circuit of the valve, in other cases as the power taken from the terminals of the main generators or equivalent point.

(B) If batteries are used state kind, if secondary cells state capacity and maximum discharge rate, if dynamo state maximum power available, and if supply mains state voltage (whether direct or alternating) and periodicity.

7. Wavelengths it is desired to use :—

(a) Spark or interrupted continuous wave.

(b) Continuous wave.

8. Number and qualifications of Operators.	9. Class of Station under Radiotelegraph Convention, 1912.	10. Nature of service to be performed.

11. Hours of service

12. Name and address of person or persons by whom radiotelegraph accounts are settled.

CERTIFICATES OF INSPECTION.

(To be completed by a competent Wireless Telegraph Engineer.)

I hereby certify that I have inspected the installation described in this application and that the particulars given are correct.

Signature

Occupation

Address

Date

192 .

DECLARATION.

I undertake to observe the conditions of the licence and hereby certify that the apparatus herein described can and will be worked in accordance with the provisions of the licence. I further declare that only operators holding certificates of competency shall be employed to work the transmitting apparatus.

Signature of Applicant

Date

192 .

This application, when completed, should be forwarded to the Director-General of Posts and Telegraphs (Wireless Branch), Simla.

Postage
Stamps

IMPORT (WIRELESS TELEGRAPHS) LICENCE.

F Registered No.
Dated

192 .

TELEGRAPHS.

Licence to Import Apparatus for Wireless Telegraphs into British India.

1. In exercise of the power given him by Notification No. 6081, dated Simla, the 22nd October, 1921, issued under section 19 of the Indian Sea Customs Act, 1878 (VIII of 1878), and in exercise of all powers and authorities enabling him in this behalf, the Director-General of Posts and Telegraphs in India (hereinafter called the Director-General) hereby grants to

of (hereinafter called the licensee), during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 , when the licence expires and becomes invalid unless renewed by endorsement thereon under the hand of the Director-General, licence and permission to import such apparatus for wireless telegraphs (hereinafter called the licensed apparatus) as is specified in the schedule annexed hereto, or as may be specified in any supplemental licence given from time to time under the hand of the Director-General, but subject to the provisions, stipulations and conditions set out in a Bond executed by the licensee in favour of the Secretary of State for India in Council on the date hereof in consideration for the granting of this licence.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192 .

Signed by the licensee

in the presence of

The day of 192 .

SCHEDULE No. Annexed to
Import (Wireless Telegraphs) Licence, Registered
No. Dated 192 .

1. Name of licensee.

2. Address of licensee

3. Places at which licensed apparatus may be imported.

4. Address of premises at which licensed apparatus may be kept.

5. Description of licensed apparatus to be imported.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The _____ day of _____ 192 :
Know all men by these presents that I

of _____ hereby bind myself to the Secretary of State for India in Council (hereinafter called the Secretary of State) in the sum of Rs. _____ to be paid to the Secretary of State, his successors or assigns or his or their certain attorney or attorneys for which payment well and truly to be made I bind myself, my heirs, executors, administrators, and representatives firmly by these presents sealed with my seal in the Christian year one thousand nine hundred and

Whereas the above bounden (hereinafter called "the licensee") is desirous of importing apparatus for wireless telegraphs under section 19 of the Sea Customs Act, 1878.

And whereas by reason of the provisions of the said Act it is unlawful to import any apparatus for wireless telegraphs except under and in accordance with a licence granted in that behalf by the Director-General of Posts and Telegraphs in India (hereinafter called the Director-General).

And whereas at the request of the licensee the Director-General has granted to the licensee by an instrument of licence dated the same day as these presents a licence under the said Act to import certain apparatus for wireless telegraphs on the licensee agreeing to observe and perform certain provisions, stipulations and conditions which are set out in the schedule hereto and to give a bond for the due observance and performance thereof.

Now the above-written obligation is entered into under the orders of the Government of India and is conditioned to be void in case the licensee shall henceforth at all times perform and observe the said provisions stipulations and conditions in the said Schedule. Otherwise the same shall be and remain in full force.

THE SCHEDULE REFERRED TO

(being the provisions, stipulations and conditions to be observed and performed by the licensee in consideration for the said licence being granted).

1. The said licence is in all respects to be subject to the Rules and to all provisions of the Telegraph Act.

2. The licensed apparatus unless and until disposed of in accordance with the provisions hereinafter mentioned shall be kept at and in no other place without the written permission of the Director-General and shall not be used for or by the licensee or by any person either on behalf or by permission of the licensee for the purpose of establishing, maintaining or working a wireless telegraph except under and in accordance with a licence granted in that behalf by the Director-General.

3. The licensee shall not assign, sell or otherwise dispose of the licence or the licensed apparatus to any person except such person produces a valid licence granted by the Director-General authorising such person to establish, maintain or work a wireless telegraph or to import apparatus for wireless telegraphs.

4. At the time of every transaction covered by the terms of section 3 hereof the licensee shall endorse upon the licence of the person with or on behalf of whom the transaction is made:—

(a) The name, description and residence of the said person;

(b) The nature of the transaction and the character and quantity of licensed apparatus involved;

(c) The date of the transaction;
and shall sign the endorsement and shall himself keep a copy of every such endorsement and produce it to the Director-General or agent authorised on demand.

5. The licensee shall immediately give information of all transactions in licensed apparatus to the Director-General and in such manner as the Director-General may direct.

6. (1) The licensee shall maintain registers of all licensed apparatus which he imports and of all disposals of the same, in such form as the Director-General may direct.

(2) He shall exhibit his stock and his registers on the demand of the Director-General or any agent authorised in that behalf in writing by him, or of any Magistrate, or any police officer of a rank not below that of Inspector.

7. The licensee shall forthwith give information to the nearest police station and to the Director-General of the loss or theft of any licensed apparatus.

8. The licensee shall at all times indemnify the Government of India against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. The licensee shall pay to the Director-General for and in respect of the licence granted a fee of Rs. 10 per annum. The said fee shall be payable before the issue of the licence and the fee payable upon renewal of the licence shall be payable before such renewal, but the Secretary of State shall not be bound to renew the licence and any renewal thereof shall be revocable by him at any time.

10. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the licensed apparatus it shall be lawful for the Director-General or any other officer specially authorised by him to cause the licensed apparatus or any premises, gear or plant connected therewith or any part thereof to be taken possession of in the name and on behalf of the Governor-General in Council and to be used for the service of the Government and subject thereto for such ordinary services as to the said officer may seem fit and in that event may enter any premises in which any such apparatus is kept and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such person as he may think fit to assume control of the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may accordingly enter any premises in which such licensed apparatus is kept.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

11. The Director-General may at any time by notice in writing and without assigning any reason revoke and determine the said licence or

any extension thereof and each and every of them shall absolutely cease, determine and become void without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any conditions or provision herein contained, but these presents shall remain in force as regards apparatus already imported or otherwise so far as the same are applicable and capable of taking effect.

12. Any notice, request, consent (whether required to be in writing or not) or act whatsoever to be given by the Secretary of State, the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General and may be served by sending the same by registered post letter to the licensee at the address as given in the licence or these presents and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General.

13. (1) In these presents the following words and expressions shall have the several meanings hereinafter assigned to them unless there is something either in the subject or context repugnant to such construction (that is to say):—

(2) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885) as amended by the Indian Telegraph (Amendment) Act, 1914 (VII. of 1914) or any future amendment or re-enactment thereof.

(3) "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for making, transmitting or receiving telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

(4) "Wireless telegraph" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(5) "Sea Customs Act" means the Indian Sea Customs Act, 1878 (VIII of 1878) or any statutory modification or re-enactment thereof for the time being in force.

(6) "Import" means bringing by sea or by land into British India.

(7) "Rules" means the Rules made from time to time under the Telegraph Act.

(8) "Licence" means the licence to import given in consideration of these presents or any extension or renewal thereof for the time being in force.

14. The licensee shall not import any apparatus or other thing whatsoever connected with wireless telegraphs except what is specified in the said licence and in accordance therewith and only so long as such licence is still in force.

15. The licence is also granted subject to the following further conditions and stipulations:—
Signed, sealed and delivered by
in the presence of

The day of 192
Dated 192 .

FIXED STATIONS LICENCE.

G Registered No.
Dated 192 .

TELEGRAPHS.

LICENCE TO ESTABLISH, MAINTAIN AND WORK
WIRELESS TELEGRAPHS IN BRITISH INDIA.

INTERPRETATION CLAUSE.

1. (1) In these presents (and in the schedule annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be

something either in the subject or context repugnant to such construction (that is to say):—

(2) "Station" means any apparatus for wireless telegraphs erected for the purpose of transmitting or receiving messages or signals, whether with or without antenna.

"Fixed stations" means stations established on land (or on board any ship permanently moored).

"Land stations" means fixed stations established for service with mobile stations, the town being used only in respect of their service with mobile stations. They are further subdivided into—

(a) "Coast stations," which are those utilised for communication with ships at sea;

(b) "Aviation stations," which are those utilised for communication with aircraft in flight.

(3) "Non-commercial stations" means fixed stations established for the purposes of research, experiment or instruction, and which are operated by the licensee solely with a view to the advancement of the art of wireless telegraphy.

"Limited commercial stations" means fixed stations established in connection with the business of the licensee, or for carrying the private or business correspondence of the licensee.

(4) "Mobile stations" means ship stations and aircraft stations.

"Ship station" means a station established on board a ship which is not permanently moored.

"Aircraft station" means a station established in any balloon, whether fixed or free, airship or flying machine.

(5) "Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India, for the time being.

(6) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885), as amended, by the Indian Telegraph (Amendment) Act, 1914 (VII of 1914).

(7) "Telegraph" has the same meaning as in the Telegraph Act.

(8) "Wireless Telegraph" means any system of communication by telegraph without the aid of any wire connecting the joints from and at which the messages or other communications are sent and received.

(9) "Rules" means the Rules made from time to time under the Telegraph Act.

(10) "International Telegraph Convention," "International Telegraph Regulations," and "Radiotelegraph Convention, 1912," mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder, and include respectively any modification of the said Conventions or Regulations made from time to time.

(11) "To radiate waves."—Apparatus shall be deemed to "radiate waves" when the transmitting apparatus is so arranged that it emits electro-magnetic waves which can be detected by a wireless telegraph receiving apparatus situated at a distance not exceeding 400 yards.

(12) "Service signalling" means signalling by means of any system of wireless telegraphs between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval, Military or Air Forces.

(13) "Certified operator" means a person who is in possession of a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs, or by the proper

authority in the United Kingdom, or in any British Possession or Protectorate.

(14) "Telegraph line" has the same meaning as in the Telegraph Act, and includes a telegraph line belonging to or worked by the Director-General of Posts and Telegraphs or constructed or maintained by him for any department of the Government of India or other body or person.

2. (1) Whereas
of

hereinafter called the licensee) is desirous of establishing, maintaining and working at the places (or within the area) in British India specified in the Schedule annexed hereto a wireless telegraph, under section 4 of the Telegraph Act for the sole purpose stated in the schedule annexed hereto;

(2) And whereas by reason of the provisions of the said Telegraph Act, it is unlawful to establish, maintain or work, and wireless telegraph in any place within British India except under and in accordance with a licence granted in that behalf by the Director-General of Posts and Telegraphs, and it is unlawful save as in the said Act provided to transmit or receive any message by telegraph within British India;

(3) And whereas at the request of the licensee the Director-General of Posts and Telegraphs has agreed to grant to the licensee under the power conferred by the said Act, the licences, powers and authorities hereinafter expressed and contained, for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing;

(4) Now these presents witness that the Director-General of Posts and Telegraphs, in exercise of all powers and authorities enabling him in this behalf, hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 (when the licence becomes invalid unless renewed by endorsement thereon under the hand of the Director-General of Posts and Telegraphs), licence and permission.

(a) To establish, maintain and work, apparatus for wireless telegraphs (hereinafter called the licensed apparatus) at the places (or within the area) specified in the schedule annexed hereto (hereinafter called the stations), and at such other places as may be specified in any supplemental licence given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental licence as aforesaid;

(ii) If employed for transmission, shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided, further, that the licensed apparatus employed for reception shall be used in such a manner as to cause no interference with other stations;

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and such other wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs;

(iv) If employed for the transmission and reception of messages, shall admit of such transmission and reception at the rate of not less than 20 words a minute, five letters being counted as one word;

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated by valves or other apparatus generating pure continuous waves, and the power to be employed for this purpose shall not exceed 100 watts, measured in the case of valves in the anode circuit, and in the case of high-frequency alternators at the input terminals of the alternator;

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and such other stations specified in the schedule annexed hereto. Provided that the transmission and reception of messages from and at the said stations shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time—

(c) (i) In the case of a station licensed for limited-commercial purposes, to receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus.

(ii) In the case of a station licensed for non-commercial purposes, no money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the licensed apparatus or any part thereof.

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs in British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said licence and permission is granted subject to the provisions of the Telegraph Act, and on and subject to the following further conditions and provisions:—

RESTRICTION ON USE OF APPARATUS.

3. (1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this licence.

(2) In the case of limited-commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Director-General of Posts and Telegraphs may prescribe that the stations must accept such messages and communicate with such stations as may be designated. In this event the licensee shall be entitled to collect a charge for the handling of such public correspondence, the amount of such charge to be as approved by the Director-General of Posts and Telegraphs.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far

as they are consistent with the other provisions of this licence, and for the purposes of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not, by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling, the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

AS TO INTERFERENCE.

6. (1) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

(2) The licensee shall so work the licensed apparatus as not to interfere with—

(a) The working of any fixed stations established in British India or the territorial waters abutting on the coast of British India, by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or any Indian State, or for commercial purposes;

(b) The transmission or reception of any messages between or at land stations and mobile stations.

STATIONS WITH WHICH LICENSED APPARATUS MAY COMMUNICATE.

7. Except as specified in clause 16, the licensed apparatus shall not be used for communicating with any stations whatsoever other than those specified in the schedule annexed hereto.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.—PROTECTION OF OPERATORS.

8. The licensed apparatus shall not, without the consent in writing of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the places mentioned in the schedule annexed hereto or in any such supplemental licence as aforesaid.

(2) The licensee shall keep the licensed apparatus, and in particular the head gear receivers thereof, in a clean and sanitary condition.

(3) The licensee shall screen all lights emanating from the licensed apparatus in such

manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

AS TO WORKING TRANSMITTING APPARATUS.

9. (1) When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules. On such occasions a certified operator shall listen on suitably adjusted receiving apparatus for three minutes, at periods not exceeding fifteen minutes, in order that he may perceive if the licensed apparatus is causing interference to authorised wireless communication. On being requested by any Government of India, Naval, Military, or Air Force station, to cease transmission the licensee shall comply immediately, and shall refrain from further transmission as long as may be required.

(2) When employed to radiate waves the call sign of the transmitting station and that of the receiving station (if any) shall be signalled or spoken at the commencement and conclusion of every transmission.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands, which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee, and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India, or by any licensee of the Government of India (other than the licensee), and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs, or any agent authorised in that behalf in writing by him, may at all reasonable times enter all or any of the said stations either solely or jointly with any other person or persons for the purpose of inspecting, and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this licence or a copy of this licence certified by the Director-General of Posts and Telegraphs shall be produced by the licensee or the person for the time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this licence for each of the stations herein licensed.

LICENCE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the licence under the hand of an officer authorised for that purpose by the

Director-General of Posts and Telegraphs to be a true copy and also such documents as may be prescribed by the Director-General of Posts and Telegraphs, and as mentioned in the schedule annexed hereto.

FEE FOR LICENCE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the licence, and the fee payable upon the renewal of the licence shall be payable before such renewal.

ROYALTY FOR LICENSED APPARATUS.

(3) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a royalty of Rs. _____ per annum in respect of each station at which the licensed apparatus is installed.

(4) The said royalty shall be payable before the issue of the licence, and the royalty payable upon the renewal of the licence shall be payable before such renewal.

LICENCE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs, the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licences, powers and authorities hereby granted, or any of such licences, powers or authorities.

SIGNALS OF DISTRESS.

16. The licensee shall, so far as possible, receive all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

AS TO INTERFERENCE WITH TELEGRAPHS, TELEPHONES AND POWER CIRCUITS AND APPARATUS.

17. (1) All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not either directly or by reason of the working or uses thereof to interfere with the efficient or convenient maintenance, working or uses of any telegraph line of the Director-General of Posts and Telegraphs which may from time to time exist, or, which it is probable, that the Director-General of Posts and Telegraphs may have occasion to erect, place, fix or use, or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or uses thereof.

(2) In case any telegraph line of the Government of India shall be damaged or the efficient working or uses thereof shall be wholly or partially interrupted or otherwise interfered with, and the Director-General of Posts and Telegraphs shall certify in writing under his hand, that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee, or by any electric circuit used or intended to be used, or by anything done by or on behalf of the licensee in relation thereto, the licensee shall on demand pay to the Government of India all costs that shall be reasonably incurred in repairing such damage, and in removing or altering such telegraph line so as to restore the same to efficient working order, and in adding thereto or substituting therefor, either temporarily or permanently, any other telegraph line if the Director-General of Posts and Telegraphs shall certify that such addition or

substitution is reasonably required by reason of such interruption or interference. Should the Director-General of Posts and Telegraphs consider that in the interests of the Government of India it is desirable that the position or circuit of the licensed apparatus be altered he may, instead of having the telegraph circuit altered or removed, order the licensee to alter or remove the licensed apparatus or circuit.

(3) The licensee shall provide against—

(a) The disturbance of the receiving apparatus of any fixed stations by electromagnetic waves of any frequency or by conduction currents emitted from the licensed apparatus.

NOTE.—For the purpose of this provision the term "disturbance" is defined as the "production of appreciable electrical effects in a syntonised receiver, other than the receiver of the licensed apparatus, adjusted as a whole to a wavelength different from that of the transmitter of the licensed apparatus."

(b) Interference with power, telegraph, telephone lines or cables in which high potential currents might be induced by means of the licensed apparatus.

(4) In the case of licensed apparatus which is not permitted to be used with an antenna, the licensee shall ensure that the station will not radiate waves, and that the effects of conducted waves or earth currents of any frequency or nature emitted by the licensed apparatus shall not be appreciable on any telegraph or power system.

POWER TO TAKE POSSESSION OF OR CONTROL LICENSED APPARATUS UPON EMERGENCY.

18. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject thereto for such ordinary services as to the said officer may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may, in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such person as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly, and in such manner as he may direct and such persons may accordingly enter any station in which any such apparatus is installed, and assume such control or the said officer may direct the licensee to submit to him or any persons authorised by him all messages tendered for transmission or received by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission or reception of any messages, or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission or reception of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India whose decision shall be final) for any damage to the

licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause the Director-General of Posts and Telegraphs may immediately thereupon cancel the licence without the licensee being entitled to any compensation and without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of such licensed apparatus or to claim damages.

PROVISIONS FOR DETERMINATION OF LICENCE.

19. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and each and every of them, as to all or any of the stations hereby licensed, and thereupon these presents and the said licences, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said stations (as the case may be) without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

LICENCE NOT TO AFFECT RIGHTS OF GOVERNOR-GENERAL IN COUNCIL.

20. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish, extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this licence expressly provided)

nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraphs Act.

NOTICES, ETC.

21. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same by registered post letter to the licensee at the address as given in the licence, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192

Signed by the licensee

in the presence of

The day of 192

SCHEDULE No.

ANNEXED TO

Fixed Station Licence, Registered No.

Dated 192

1. Name of licensee.

2. Address of licensee.

3. Purpose for which station is licensed.

4. Official name of station—Exact location. If movable, place in which station is normally located and area over which it is permitted to be moved.

5. Call sign.

6. The station is licensed as a (*) station, Class (†)

(*) Here insert the "type" of station as shown in the table below.

(†) Here insert the "class" of station as shown in the table below.

Type.	Class.	Apparatus Allowed.	Communication allowed.
Limited-Commercial ..	I	Transmission and Reception	Morse, or Morse and Speech.
Ditto ..	II	Ditto	Speech only.
Ditto ..	III	Reception only	Morse and/or Speech.
Non-Commercial ..	I	Transmission and Reception	Morse and/or Speech.
Ditto ..	II	Reception only	Ditto.
Ditto ..	III	Transmission and Reception	Nil Apparatus NOT to be used with Antenna.

Name.	Address.	Qualification.

7. Antenna—
 - (a) Description.
 - (b) Height feet.
 - (c) Horizontal length above ground feet.
 - (d) Method of support.
 8. Details of Apparatus—
 - (a) Transmitting.
 - (b) Receiving.
 9. Wavelengths (metres)—

Normal transmitting wave ..

Additional waves authorised ..

Range of waves over which apparatus is capable of transmitting

Normal receiving wave ..

Additional waves authorised ..

Range of waves over which apparatus is capable of receiving
 10. Power—
 - (a) Source
 - (b) Point where measured
 - (c) Volts. Amperes
 - (d) D/C. or A/C
 - (e) Cycles per second (A/C.)
 - (f) Maximum watts to be taken by transmitting instruments.
 11. The station is licensed to communicate with the following stations only:—
 12. The provisions of clause 11 of this licence do not apply to the following messages:—
 13. Hours during which station may work (Indian standard time)—
 - (a) Transmitting to
 - (b) Receiving to
 14. Certified operators—
 15. Authorised charges for transmission and reception of messages—
 - (a) Messages on behalf of His Majesty's Government (centimes per word).
 - (b) Other messages (centimes per word).
 16. List of documents to be kept at the station—
 - (a) Certified copy of the licence and schedule.
 - (b) General Rules and Departmental Instructions for Radiotelegraph Stations in India.
 - (c) Post and Telegraph Guide (latest Indian edition).
- Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of
- The day of 192 .

MOBILE STATIONS (SHIPS AND AIRCRAFT) LICENCE.

H Registered No. _____
Dated _____ 192 .

TELEGRAPHS.

Licence to establish, maintain and work Wireless Telegraphs in Ships and Aircraft registered in British India.

INTERPRETATION CLAUSE.

1. (1) In these presents (and in the schedule annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say)—

(2) "Station" means any apparatus for wireless telegraphs erected for the purpose of transmitting or receiving messages or signals, whether with or without antenna.

"Fixed stations" means stations established on land (or on board any ship permanently moored).

"Land stations" means fixed stations established for service with mobile stations, the term being used only in respect of their service with mobile stations. They are further subdivided into—

(a) "Coast stations" which are those utilised for communication with ships at sea;

(b) "Aviation stations" which are those utilised for communication with aircraft in flight.

(3) "Non-commercial stations" means fixed stations established for the purposes of research, experiment or instruction and which are operated by the licensee solely with a view to the advancement of the art of wireless telegraphy.

"Limited-commercial stations" means fixed stations established in connection with the business of the licensee or for carrying the private or business correspondence of the licensee.

(4) "Mobile stations" means ship stations and aircraft stations.

"Ship station" means a station established on board a ship which is not permanently moored.

"Aircraft station" means a station established in any balloon, whether fixed or free, airship or flying machine.

(5) "Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India for the time being.

(6) "Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885) as amended by the Indian Telegraph (Amendment) Act, 1914 (VII of 1914).

(7) "Telegraph" has the same meaning as in the Telegraph Act.

(8) "Wireless telegraph" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(9) "Rules" means the rules made from time to time under the Telegraph Act.

(10) "International Telegraph Convention," "International Telegraph Regulations," and "Radiotelegraph Convention, 1912," mean respectively the International Convention of St. Petersburg, dated the 10th-22nd July, 1875, and the Service Regulations made thereunder; the International Radiotelegraph Convention, dated the 5th July, 1912, and the Service Regulations made thereunder and include respectively any modification of the said Conventions or Regulations made from time to time.

(11) "To radiate waves."—Apparatus shall be deemed to "radiate waves" when the transmitting apparatus is so arranged that it emits electro-magnetic waves which can be detected by a wireless telegraph receiving apparatus situated at a distance not exceeding 400 yards.

(12) "Service signalling" means signalling by means of any system of wireless telegraphs between any fixed or mobile stations of His Majesty's Imperial, Dominion or Indian Naval Military or Air Forces.

(13) "Certified operator" means a person who is in possession of a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs or by the proper authority in the United Kingdom, or in any British Possession or Protectorate.

2. (1) Whereas

of _____ (hereinafter called the licensee) is desirous of establishing maintaining and working in the ships and aircraft registered in British India specified in the schedule annexed hereto a wireless telegraph under section 4 of

the Telegraph Act for the sole purpose stated in the schedule annexed hereto ;

(2) And whereas, it is unlawful to establish, maintain or work any wireless telegraph in any ship or aircraft registered in British India except under and in accordance with a licence granted in that behalf by the Director-General of Posts and Telegraphs ;

(3) And whereas at the request of the licensee the Director-General of Posts and Telegraphs has agreed to grant to the licensee under the power conferred by the said Act, the licenses, powers and authorities hereinafter expressed and contained for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing ;

(4) Now these Presents witness that the Director-General of Posts and Telegraphs in exercise of all powers and authorities enabling him in this behalf hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 192 , when (the licence becomes invalid unless renewed by endorsement thereon under the hand of the Director-General of Posts and Telegraphs), licence and permission.

(a) To establish, maintain and work apparatus for wireless telegraphs (hereinafter called the licensed apparatus) in the ships and aircraft specified in the schedule annexed hereto (hereinafter called the stations) and in such other ships and aircraft as may be specified in any supplemental licence given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the rules, and provided that the licensed apparatus—

(i) Shall be of the character specified in the said schedule or in any such supplemental licence as aforesaid ;

(ii) If employed for transmission shall be of such a character that the waves emitted are as pure and as little damped as possible, and the licensed apparatus employed for reception at each station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals. Provided further, that the licensed apparatus employed for reception shall be used in such a manner as to cause no interference with other stations.

(iii) Shall be so constructed as to be capable of using wavelengths specified in the said schedule as measured by the standard of measurement in use for the time being by the Government of India and other such wavelengths as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs ;

(iv) Shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute, five letters being counted as one word.

(v) Shall be so constructed that if it is employed to radiate waves these shall only be propagated—

In the case of ship stations by spark, interrupted continuous wave (*i.e.*, "tonic train" or "modulated by abrupt interruption") or valves or other apparatus generating pure continuous waves ;

In the case of aircraft stations by interrupted continuous wave or valves or other apparatus generating pure continuous waves and the power to be employed shall not exceed 100 watts, measured in the case of valves in the anode circuit and in the case

of high frequency alternators at the input terminals of the alternator ;

(b) To transmit and receive messages by means of the licensed apparatus between the said stations and between the said stations and land stations and other mobile stations. Provided that the transmission and reception of messages from and at the said stations when in Indian territorial limits shall be subject to such conditions and restrictions as the Director-General of Posts and Telegraphs may prescribe from time to time ;

(c) To receive money and other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or reception of messages by means of the said apparatus ;

(d) To import the licensed apparatus into British India or to obtain the same from any person licensed to import wireless telegraphs into British India, and to transport the licensed apparatus from the place of importation or the premises of the said person licensed to import wireless telegraphs, as the case may be, to the station.

And it is hereby declared that the said licence and permission is granted subject to the provisions of the Telegraph Act and on and subject to the following further conditions and provisions—

RESTRICTION ON USE OF APPARATUS.

3. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for any purpose whatsoever except that specified in the schedule annexed hereto, or for the transmission or reception of messages except messages authorised by this licence.

LICENSEE TO OBSERVE CERTAIN INTERNATIONAL CONVENTIONS, ETC.

4. (1) The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, so far as they are consistent with the other provisions of this licence. In the case of licences for aircraft stations the expressions "ship" and "ship stations" in the Convention being read as if "aircraft" and "aircraft station" were substituted therefor.

(2) For the purposes of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphs in common with land and submarine telegraphs.

PROTECTION OF SERVICE SIGNALLING.

5. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with service signalling.

(2) If the Director-General of Posts and Telegraphs is of opinion that the working of the licensed apparatus is inconsistent with the free use of service signalling the licensee shall, when required in writing by the Director-General of Posts and Telegraphs so to do, close the said station ; the making of such a requisition shall be conclusive evidence of the opinion of the Director-General of Posts and Telegraphs to the effect aforesaid.

(3) Whenever the operators of the said station perceive through the medium of the licensed apparatus that service signalling is proceeding with which the licensed apparatus is likely to interfere, they shall refrain from using the licensed apparatus until all indications that such service signalling is proceeding shall have ceased.

(4) These provisions for the protection of the service signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

AS TO INTERFERENCE.

6. The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other fixed or mobile stations and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other station.

LICENSED APPARATUS NOT TO BE ALTERED OR MOVED.

7. The licensed apparatus shall not without the consent in writing of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars, or moved from the ships or aircraft mentioned in the schedule annexed hereto or in any such supplemental licence as aforesaid.

PROTECTION OF OPERATORS.

8. (1) The licensee shall keep the licensed apparatus and in particular the head gear receivers thereof in a clean and sanitary condition.

(2) The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of the certified operator.

CERTIFIED OPERATORS TO WORK TRANSMITTING APPARATUS.

9. When employed to radiate waves the licensed apparatus shall be worked only by a certified operator, and the licensee shall provide for the working of the station such certified operators as are required by the provisions of the rules, or of any rule under the Indian Merchant Shipping Act, 1923.

LICENSEE TO INDEMNIFY THE GOVERNMENT OF INDIA.

10. The licensee shall at all times indemnify the Government of India against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

PROVISIONS AS TO SECRECY.

11. Except as specified in the schedule annexed hereto, the licensee shall not divulge to any person (other than the properly authorised officials of the Government of India or under orders of a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by service signalling or by any system of wireless telegraphy established and maintained by or for the purposes of the Director-General of Posts and Telegraphs or any Department of the Government of India or by any licensee of the Government of India (other than the licensee) and shall be subject in this respect to the penalties specified in the Telegraph Act.

POWER OF DIRECTOR-GENERAL OF POSTS AND TELEGRAPHS TO INSPECT LICENSED APPARATUS.

12. The Director-General of Posts and Telegraphs or any agent authorised in that behalf in writing by him may at all reasonable times enter all or any of the said stations, either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus

fixed or being in such stations respectively and the method of working and uses of such apparatus and telegraphic instruments respectively. At the request of any such authorised officer this licence or a copy of this licence certified by the Director-General of Posts and Telegraphs shall be produced by the licensee or the person for the time being in charge of and authorised to work the licensed apparatus. The Director-General of Posts and Telegraphs shall provide one certified copy of this licence for each of the stations herein licensed.

LICENCE AND OTHER DOCUMENTS TO BE KEPT AT STATIONS.

13. The licensee shall cause to be kept at every station mentioned in the said schedule a certified copy of the licence under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy, and also such documents as may be prescribed by the Director-General of Posts and Telegraphs and as mentioned in the schedule annexed hereto.

FEE FOR LICENCE.

14. (1) The licensee shall pay to the Director-General of Posts and Telegraphs for and in respect of the licence hereby granted a fee of Rs. 10 per annum in respect of each station at which the licensed apparatus is installed.

(2) The said fee shall be payable before the issue of the licence and the fee payable upon the renewal of the licence shall be payable before such renewal.

LICENCE NOT TO BE ASSIGNED.

15. Except with the consent in writing of the Director-General of Posts and Telegraphs the licensee shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licences, powers and authorities hereby granted, or any of such licences, powers or authorities.

MESSAGES TO BE TRANSMITTED WITHOUT FAVOUR OR PREFERENCE.

16. Subject to the provisions of this licence and of the rules, the licensee shall transmit and receive messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise.

SIGNALS OF DISTRESS.

17. The licensee shall so far as possible receive all requests for assistance and all signals of distress, and shall answer such requests and signals, and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

ACCOUNTS, RECORDS, ETC.

18. (1) The licensee shall keep full accounts, records and registers of all messages transmitted or received by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Director-General of Posts and Telegraphs shall from time to time reasonably require to be shown, messages on the service of the Government of India being distinguished from other messages in such registers.

(2) The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least 15 months counting from the month following that in which the radiotelegram were handed in as prescribed by the Radiotelegraph Convention, 1912, and in default of any provisions on the subject in the said Convention

for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Director-General of Posts and Telegraphs or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

(3) The licensee shall render to the Director-General of Posts and Telegraphs such accounts as the latter may from time to time direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the stations hereby licensed and land stations, and shall pay to the Director-General of Posts and Telegraphs at such times and in such manner as the latter may direct all sums which shall be due from the licensee in accordance with such accounts.

POWER TO TAKE POSSESSION OF OR CONTROL LICENSED APPARATUS UPON EMERGENCY.

19. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General of Posts and Telegraphs or any other officer specially authorised by him to cause the licensed apparatus and any premises, gear, or plant connected therewith, or any part thereof, to be taken possession of in the name and on behalf of the Governor-General in Council, and to be used for the service of the Government and subject thereto for such ordinary services as to the said officers may seem fit, and in that event he may enter any stations in which any such apparatus is installed, and take possession of the said apparatus, and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such person as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may accordingly enter any station in which any such apparatus is installed and assume such control or the said officer may direct the licensee to submit to him or any persons authorised by him all messages tendered for transmission or received by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission or reception of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission or reception of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation (to be fixed by a sole arbitrator nominated by the Government of India, whose decision shall be final) for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

(4) In the event of the licensee refusing to comply with the provisions of sections (1) and (2) of this clause, the Director-General of Posts and Telegraphs may immediately thereupon cancel the licence without the licensee being entitled to any compensation, and without prejudice to any steps the Governor-General in Council may think fit to take, to obtain possession of such licensed apparatus or to claim damages.

PROVISIONS FOR DETERMINATION OF LICENCE.

20. The Director-General of Posts and Telegraphs may at any time, by notice in writing, but without assigning any reason revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and each and every of them as to all or any of the stations hereby licensed, and thereupon these presents and the said licences, powers and authorities, and each and every of them, shall absolutely cease, determine, and become void as to all or any of the said stations (as the case may be), without the licensee being entitled to any compensation and without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

LICENCE NOT TO AFFECT RIGHTS OF GOVERNOR-GENERAL IN COUNCIL.

21. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council from time to time to establish extend, maintain and work any system or systems of telegraph communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or in Indian territorial waters by means of wireless telegraphs or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraph Act.

NOTICES, ETC.

22. Any notice, request or consent (whether required to be in writing or not) to be given by the Governor-General in Council or the Government of India under these presents may be under the hand of the Director-General of Posts and Telegraphs, and may be served by sending the same registered post letter to the licensee at the address as given in the licence, and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Director-General of Posts and Telegraphs, India.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council.

in the presence of

The day of 192
Signed by the licensee

in the presence of

The day of 192

SCHEDULE No. ANNEXED TO
MOBILE STATION LICENCE, REGISTERED No.
Dated 192 .

1. Name of licensee.
2. Address of licensee.
3. Purpose for which station is licensed—
Communication with land and mobile stations.
4. Name of ship or number of aircraft—
In which station is established.
5. Port or place of registry.

6. Particulars of apparatus—
 - (a) Transmitting.
 - (b) Receiving.
 - (c) If emergency set is installed.
7. Power—
 - (a) Source.
 - (b) Point where measured.
 - (c) Volts, amperes.
 - (d) D/C. or A/C.
 - (e) Cycles per second (A/C.).
 - (f) Maximum watts to be taken by transmitting instruments.
8. Authorised wavelengths (metres). See note. Spark, 300, 600, 1,800. C.W.
9. Number and qualification of operators.
10. Class of ship station under Radiotelegraphic Convention, 1912.
11. Nature of services performed.
12. Hours of service.
13. Authorised charges for transmission and reception of messages—
 - (a) Messages on behalf of His Majesty's Government (centimes per word).
 - (b) Other messages (centimes per word).
14. Name and address of person or persons by whom radiotelegraph accounts are settled.
15. List of documents to be kept at the station—
 - (a) Certified copy of the licence and schedule.
 - (b) General Rules and Departmental Instructions for Radiotelegraph stations in India.
 - (c) Post and Telegraph Guide (latest Indian edition).
 - (d) International List of Radiotelegraph Stations.
 - (e) Liste Alphabétique des Indicateurs d'Appel.

AUTHORISED WAVELENGTHS.

In the case of ship stations, the licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres. The licensed apparatus may be so constructed as to use any of the other wavelengths specified or any wavelengths specified or any wavelengths prescribed by any administration for communication with direction finding stations. Provided always that the wavelength of 1,800 metres may be used for

transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912.

In the case of aircraft stations, the licensed apparatus shall be so constructed as to be capable of using waves of 600 metres (hereinafter referred to as the "aircraft ship wave") and 900 metres (hereinafter referred to as the "aircraft normal wave"). It may also be constructed so as to be capable of using the other waves specified as "optional waves." Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres it must always be capable of using 2,400 metres continuous wave. Provided further that the waves before referred to shall not be used without the written permission of the Director-General.

The use of the aircraft ship wave shall be confined to the system known as "interrupted continuous" wave (*i.e.*, "tonic train" or "modulated by abrupt interruptions") save in the case of great emergency when if the use of this system is impracticable this wave may be used for the transmission and receipt of spoken messages. The aircraft normal wave shall be used only for the purpose of transmitting spoken messages or for continuous waves.

The transmitting apparatus may be so constructed as to be capable of varying the wave emitted by an amount not exceeding 3 per cent. above and below the wave in use. Provided always that such variation from the normal wave shall only be employed when first calling, when communication has not been established when first calling, or in case of distress.

The receiving apparatus may be so constructed as to receive waves of any length, but it shall be constructed so as to receive the aircraft ship and aircraft normal waves. Provided always that if the transmitting apparatus is capable of using the waves mentioned above the receiving apparatus shall be so constructed as to be capable of receiving these waves.

Signed by the Director-General of Posts and Telegraphs for and on behalf of the Governor-General in Council in the presence of

The day of 192

BRITISH NORTH BORNEO

(See Maps 17 and 22).

Including : Sarawak and Brunei.

THIS territory is under the jurisdiction of the British North Borneo Company, being held under grants from the Sultans of Brunei and Sulu. (Royal Charter in 1781). The territory is administered by a Governor (appointed with the approval of the Secretary of State) in Borneo and a Court of Directors in London, appointed under the Charter. On May 12th, 1888, the British Government proclaimed a formal protectorate over the State of North Borneo.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. C. F. Newton Wade, A.M.I.R.E.	Postmaster-General and Superintendent of Telegraphs	Jesselton.
Mr. H. A. Dabell	Assistant Postmaster and Assistant Superintendent of Telegraphs	Sandakan.

ORGANISATION.

Radiotelegraph intercommunication is maintained by four 5-kilowatt Government stations situated at Jesselton, Sandakan, Kudat and Tawau respectively. The Siemens Quenched Spark system is employed throughout. No Amateur or Experimental Wireless Stations or Clubs exist in this country, and no Amateur Stations are at present licensed.

A new station has been opened at Silimpopon.

ADMINISTRATION.

Wireless telegraphy is administered in accordance with the provisions of the following ordinance:—

A—Wireless Telegraphy Proclamation, 1914.

WIRELESS TELEGRAPHY PROCLAMATION, 1914.

A British North Borneo has been included as a party in the International Radiotelegraphic Convention.

The following proclamation controls the use of wireless telegraphy:—

1. This proclamation may be cited as "The Wireless Telegraphy Proclamation, 1914," and shall come into force upon the publication thereof in the *Gazette*.

2. (i) In this proclamation the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Proclamation, 1901," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government or by bodies corporate established under and subject to the laws of this State, and having their principal place of business within this State.

(ii) Nothing in this Ordinance shall prevent any person from making or using apparatus other than for the purpose of the transmission or reception of messages or for the radiation of electrical energy or waves.

3. The Governor may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in this State or on board any locally owned ship.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in this State or on board any locally owned ship except under and in accordance with a licence granted in that behalf by the Governor.

(ii) Every such licence shall be in such form and for such periods as the Governor may determine, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (i) Any person establishing a wireless telegraphy station without a licence in that behalf, or installing or working any apparatus for wireless telegraphy without a licence in that behalf, shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, provided that no proceedings shall be taken against any person under the proclamation except with the previous sanction of the Governor.

(ii) On being satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that

behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf, a magistrate may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor may make and, when made, vary or cancel rules more particularly for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under the proclamation are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, in the waters of this State shall be worked so as to prevent the interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in this State or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Superintendent of Telegraphs, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, whilst such ship is in any of the harbours of this State;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships or British or foreign ships, in the waters of this State, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, either in all cases or in such cases as may be deemed desirable;

(f) And generally for the more effectual carrying out of the provisions of this proclamation.

(ii) No rules made in respect of the matters described in paragraphs (c), (d), and (e) of sub-section (i) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. On an application for a licence proving to the satisfaction of the Governor that the whole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted to such applicant, subject to such special terms, conditions, and restrictions as the Governor may think proper that such licence shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with, and every act done or attempted to be done contrary to, the provisions of the pro-

clamation, or of any rule made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against, not otherwise specially provided for, the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(ii.) All convictions, forfeitures, and fines under this proclamation, or any rules made thereunder, may be had and recovered before the Court of a Magistrate of the First Class.

SARAWAK

THE Administration is conducted by the Rajah, Charles Vyner Brooke, assisted by a Supreme and a General Council. The Civil Service is composed of British officers selected by the Rajah.

CONTROL.

The Radiotelegraph and Telephone Department is a separate unit from the Post Office, and is in the sole charge of the manager, who deals in all matters relating to the wireless telegraph and telephone service.

ORGANISATION.

Radio communication was instituted by the Government for public and official use in April, 1917. The chief station is at Kuching, the capital of Sarawak. Sub-stations are situate at Miri, Sibü, Sadong and Goebilt. The Compagnie Général de Radiotélégraphie, Paris," system is employed throughout, except at Goebilt, which was constructed locally by the department.

There are two experimental stations; other experimental stations are allowed, provided the transmitter wavelength does not exceed 400 metres.

ADMINISTRATION.

There are no regulations obliging ships trading in Sarawak waters to be fitted with wireless.

The following are the regulations relating to wireless in the Protectorate of Sarawak.

A—Wireless Telegraphy Order, 1921.

ORDER, No. XIX, 1921.

A 1. This Order may be cited as the "Wireless Telegraphy Order, 1921," and shall come into force upon the publication thereof in the *Government Gazette*.

2. (i) In this Order the expression "Wireless Telegraphy" means any system of communication by telegraph or telephone without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(ii) Nothing in this Order shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. His Highness the Rajah, whenever he shall deem it expedient so to do, may licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Sarawak or on board any ship registered in Sarawak.

4. (i) No person shall erect or establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in Sarawak except under and in accordance with a licence granted by His Highness the Rajah.

(ii) Every such licence shall be in such form and for such period as His Highness the Rajah may determine, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as His Highness the Rajah shall consider desirable in the public interest.

5. (i) If any person erects or establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Order except with the previous sanction of His Highness the Rajah.

(ii) On being satisfied by information that there is reasonable ground for believing that a wireless telegraph station has been erected or established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf, a Judge of the Supreme Court or Police Magistrate or District Officer

may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. The regulations in the schedule to this Order shall have effect except in so far as they may be amended or rescinded by further regulations made by His Highness the Rajah for carrying into effect the purposes of this Order.

7. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Order or of any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against this Order, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Order or any regulations made thereunder,

may be had and recovered before a Resident's Court.

THE SCHEDULE.

(1) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the State shall be worked in such a way as not to interfere with the working of any wireless telegraphy station lawfully established, installed or worked in the State or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any harbour of the State except with the special or general permission of His Highness the Rajah.

(3) These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

By Order of His Highness the RAJAH.

BRITISH SOMALILAND (Protectorate)

(See Maps 25 and 30.)

THE Somali coast is administered by a British Governor. Egyptian control ceased in 1884, and the territory then fell under the administration of the Indian Government. It was taken over by the Foreign Office on October 1st, 1898, and was transferred to the Colonial Office on April 1st, 1905.

CONTROL.

The control of wireless telegraph operations is vested in the Posts and Telegraphs Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. C. R. Keyte	Director of Posts and Telegraphs	Berbera
Mr. C. V. Magill	Assistant-Director of Posts and Telegraphs ..	Berbera
Mr. A. J. S. Culpeper ..	Superintendent of Telegraphs	Berbera

ORGANISATION.

The first stations were erected in 1910 at Berbera and Aden (on the Asiatic coast), the latter being in telegraphic communication with the Eastern Telegraph Company's Aden Station. Subsequently other stations were erected, at Bulhar (1913), at Burao (1916), at Las Dureh (1918), and at Hargeisa (1919).

ADMINISTRATION.

The first Ordinance to regulate radiotelegraphy in the Somaliland Protectorate was passed in 1908. It was called Ordinance No. 6 of 1908 and enacted that the full control of radiotelegraphy should be vested in the Commissioner, and any person contravening his regulations should be liable on conviction to a fine not exceeding £100 or imprisonment for 12 months, together with confiscation of his apparatus. A new Ordinance repealing the above was passed in 1913, and appears *in extenso* below. This constitutes the extant governing decree under which wireless is at present administered.

We append the text of the following :—

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations thereunder.

ORDINANCE.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which messages or other communications are sent or received. Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Protectorate, except under and in accordance with a licence granted in that behalf by the Commissioner.

(2) Every such licence shall be in such form and for such period as the Commissioner may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Protectorate, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Commissioner may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication have the same effect as if enacted in this Ordinance.

(2) The regulations in the schedule to this Ordinance shall have effect in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Protectorate shall be subject to such further regulations as may be made by the Commissioner from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any licence granted under this Ordinance, he may grant a search-warrant to any Police Officer or any person appointed in that behalf by the District Commissioner and named in the warrant, and a warrant so granted shall authorise the Police Officer or

person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to fine not exceeding rupees seven hundred and fifty, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the District Court, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphs Ordinance, 1908, is hereby repealed.

SCHEDULE.—SECTION 5 (2).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Protectorate shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Protectorate or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless stations established on ships at sea.

ii. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Protectorate, except with the special or general permission of the Commissioner.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BRITISH WEST INDIES

BAHAMAS.

CONTROL AND ORGANISATION.

IN 1912 a scheme of linking up the out-islands of the Colony with Nassau by radiotelegraphy was started and stations were installed on the Islands of Eleuthera, Bimini, Harbour-Island and Inagua. Stations have recently been erected at Elbow Cray and Norman's Castle on Abaco Island.

All land stations are controlled by the Governor in Council

There are no time, meteorological, hydrographic or press services or direction finding stations.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
P. H. Burns	Superintendent and Electrical Engineer	Nassau.

ADMINISTRATION.

The Radiotelegraph Act, 1913, regulates the administration of wireless telegraphy.

A—Radiotelegraphic Act, 1913.

B—Rules made thereunder.

RADIOTELEGRAPHIC ACT, 1913.

3 AND 4 GEORGE V, CHAPTER 7.

AN ACT

FOR ESTABLISHING RADIOTELEGRAPHIC COMMUNICATION IN THE COLONY AND BETWEEN THE COLONY AND PARTS BEYOND THE LIMITS OF THE COLONY.

(Assented to 7th July, 1913.)

A *May it please the King's Most Excellent Majesty that it may be enacted and be it enacted by His Excellency George Basil Haddon-Smith, Esquire, Companion of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Bahama Islands, the Legislative Council and Assembly of the said Islands, and it is hereby enacted and ordained by the authority of the same as follows:—*

1. This Act may be cited as the Radiotelegraph Act, 1913, and together with the Telegraph Act, 1891, and the Acts amending the same, may be cited as the Telegraph Acts, 1891 to 1913.

2. In this Act unless the context otherwise requires:—

“Rules” means Rules made under this Act.

“Superintendent” means the Superintendent of Telegraphs and Electrical Engineer.

3. (1) It shall be lawful for the Governor in Council—

(a) To make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in New Providence for radiotelegraphic communication between New Providence and other parts of the Colony and parts beyond the limits of the Colony and for such purpose to make and enter into any contract as may be requisite: The contract entered into on the 3rd day of December, 1912, between the Crown Agents for the Colonies acting for and on behalf of the Government of the Colony, and the Anglo-French Wireless Telegraph Company, Ltd., shall be deemed to be a contract entered into under the provisions of this Act.

(b) With any funds that may hereafter from time to time be specifically granted by the Legislature for the purpose to make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in any Out Island for radiotelegraphic communication between such Out Island and any other parts of the Colony and parts beyond the limits of the Colony, and for such purpose to make and enter into any contract as may be requisite.

(c) To grant licences for the erection, construction, establishment or maintenance of instruments or apparatus for the purpose of transmitting or receiving messages within the Colony and across the seas by means of radiotelegraphy and for the transmission or reception of any such messages. Any licence granted under this Act shall be subject to such conditions and restrictions as the Governor in Council may prescribe.

(d) To make rules—

(i) For the proper and efficient working of any radiotelegraph station from time to time established under this Act;

(ii) Fixing the rates and charges for the transmission of messages thereby;

(iii) Regulating the conditions under which messages may be transmitted;

(iv) Prescribing the duties of the operator and probationers employed at any such station;

(v) For controlling the user of any instruments or apparatus erected, constructed, established or maintained under a licence granted under this act and the transmission or reception of any messages thereby;

(vi) For the training and examination of probationers;

(vii) For obtaining secrecy on the part of all persons employed in or in any way connected with the maintenance and working of any radiotelegraph station established under this Act and prescribing the form and nature of any oath of secrecy to be taken by any such persons; and

(viii) Generally for fully carrying into effect the objects of this Act.

(2) All radiotelegraph stations established under sub-sections (a) and (b) of sub-section (1) of this section shall be under the control of the Governor in Council.

4. It shall be lawful for the Governor, when in his opinion an emergency has arisen in which it is expedient for the public service that His Majesty should have control over the transmission and reception of messages to or from any radiotelegraph station in the Colony, to take possession of and assume control of any radiotelegraph station in the Colony to be used for His Majesty's service and subject thereto for such ordinary service as may seem fit, or to direct and authorise such persons as he thinks fit to assume the control of the transmission and reception of messages either wholly or partly and in such manner as he directs.

5. (1) Whosoever shall unlawfully and maliciously cut, break, throw down, destroy, injure, remove or in any way interfere with any battery, machinery, wire, mast, post or other matter or thing whatsoever being part of, or being used or employed in or about any radiotelegraph station under this Act or in the working thereof shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for five years.

(2) Whosoever shall unlawfully or maliciously in any manner whatsoever prevent or obstruct the sending, conveying or delivery of any communication by radiotelegraphy under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for two years.

Provided that if it shall appear to any magistrate upon a preliminary inquiry into an offence against this section that it is not expedient to the ends of justice that any person charged with an offence against this section should be prosecuted in the Supreme Court, such magistrate may proceed summarily to hear and determine the charge and the offender shall on conviction thereof at the discretion of the magistrate, be liable to a penalty of £10 or to be imprisoned for one year.

6. Any person employed or engaged in any capacity whatsoever under this Act who shall, contrary to his duty, disclose or in any way make known or intercept the contents or any part of the contents of any message transmitted or received or to be transmitted or received to or at any radiotelegraph station under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for one year.

7. Whosoever shall unlawfully and maliciously by any overt act attempt to commit any of the offences mentioned in sections 5 and 6 of this Act shall on conviction thereof before a magistrate be liable, at the discretion of the magistrate, to a penalty of £5 or to be imprisoned for three months.

8. Any person who erects, constructs, establishes or maintains or commences to erect, construct, establish or maintain any instrument or apparatus for the purpose of transmitting or receiving or who transmits or receives messages within the Colony or across the seas by means of any radiotelegraphy whatsoever without having first obtained a licence so to do under this Act, shall be liable on summary conviction before a magistrate to a penalty of £200 or to be imprisoned for one year, anything in the Magistrates Act, 1896 to 1909, or any act passed in amendment thereof or in substitution therefor to the contrary notwithstanding.

9. Any radiotelegraph station established under this Act with funds granted by the

Legislature and any apparatus, machinery, matter or thing used in connection therewith, is hereby declared to be the property of the Government of the Colony, and in all legal proceedings whatsoever instituted and taken in relation thereto the same may be laid and referred to as the property of the said Government.

10. The Acts set out in the Schedule to this Act are hereby repealed.

SCHEDULE.

Regnal Year and Chapter.	Short Title.
2 Ed. VII c. 22	The Wireless Telegraphy Restriction Act, 1902.
3 Ed. VII c. 17	The Wireless Telegraphy Restriction Amendment Act, 1903.

RULES

MADE BY THE GOVERNOR IN COUNCIL ON THE 3RD DAY OF NOVEMBER, 1913, UNDER THE AUTHORITY OF THE TELEGRAPH ACTS 1891 TO 1913.

B Paragraphs 1-14 inclusive refer solely to the wired telegraph system.

15. The radiotelegraph system shall be operated under the rules contained in the "Detailed Service Regulations" appended to the International Radiotelegraph Convention signed at London on the 5th day of July, 1912.

A copy of such "Detailed Service Regulations" shall be kept on file in the telegraph offices.

16. All apparatus for radiotelegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any radiotelegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

17. No apparatus for radiotelegraphy on board a merchant ship shall be worked or used whilst such ship is in the territorial waters of the Colony, except with the special or general permission in writing of the Governor.

18. Rules 16 and 17 shall not apply to the use of radiotelegraphy for the purpose of making or answering signals of distress.

19. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by radiotelegraphy the use of radiotelegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Council from time to time and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

20. The master of any merchant ship on board of which apparatus for radiotelegraphy shall be worked or used contrary to these Rules shall on summary conviction before a Magistrate be liable to pay a penalty of £200 and in default of payment to be imprisoned for a period of twelve months.

TARIFF OF CHARGES.

21. From New Providence to the American Coast ninepence-halfpenny a word, plus the charges over the lines of other telegraph administrations, as published in the tariff book of the Western Union Telegraph Company, a copy of which shall be kept on file in the telegraph offices.

From New Providence to radio ship stations, threepence for each word, plus the rate charged by the ship station.

A "Deferred Message Service" at half the ordinary charge per word is in effect between the Bahamas and certain other countries.

A list of such countries and a copy of the rules governing this class of message shall be kept on file in the telegraph offices.

Made by the Governor in Council this 3rd day of November, 1913.

By order,

W. H. HADDON-SMITH, Captain,
Clerk to the Executive Council.

BARBADOS

(See Map 45.)

ADMINISTRATION.

WIRELESS telegraphy in Barbados is worked under three Acts and one set of regulations, the Barbados Wireless Act of 1905, two Amending Acts, passed in 1913 and 1917, and a number of rules made under these latter Acts.

As these are quite distinct, we publish their respective texts below:—

A—Wireless Act, 1905 (confirmed 1908).

B—Wireless and Submarine Telegraph (Amendment) Act, 1913.

C—Wireless and Submarine Telegraph (Amendment) Act, 1917.

D—Rules made under the 1913 and 1917 Acts.

WIRELESS ACT, 1905 (CONFIRMED 1908).

A 1. This Act may be cited as the Wireless and Submarine Telegraph Act, 1905.

2. (1) The West India and Panama Telegraph Company shall not lay down or maintain a new telegraph cable nor shall any other company or person lay down or maintain any telegraph cable upon the foreshore and bed of the sea except under and in accordance with an Act of the Legislature.

(2) A person shall not establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy in any place in this island except under and in accordance with an Act of the Legislature.

(3) If the West India and Panama Telegraph Company lays down or maintains a new telegraph cable or if any other company or person lays down or maintains any telegraph cable upon the foreshore or bed of the sea without the authority of an Act of the Legislature in that behalf, the company or person shall be liable, on conviction before a Police Magistrate, to a penalty not exceeding £100, and shall forthwith remove the telegraph cable, and if the telegraph cable be not removed within one day after such conviction the company or person shall be liable to a penalty not exceeding £50 for each day thereafter during which the company or person shall fail to remove the telegraph cable. Provided, that the Governor-in-Executive Committee may at any time after the expiration of one day from the date of the conviction cause the same to be removed and destroyed.

(4) If any person establishes a wireless telegraph station without the authority of an Act of the Legislature in that behalf, or installs or works any apparatus on any place in this island for wireless telegraphy without such authority in that behalf, he shall be liable, on conviction before a Police Magistrate, to a

penalty not exceeding £100, and further be liable to forfeit any apparatus for wireless telegraphy installed or worked without such authority.

(5) If a Police Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without legal authority in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place within his jurisdiction without such authority in that behalf, he may grant a search warrant to any police officer named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station or place and to seize any apparatus which appears to him to have been used, or intended to be used, for wireless telegraphy therein.

(6) No proceedings shall be taken under any of the provisions of this section except by order of the Governor.

WIRELESS ACT, 1913.

Passed on April 11th, 1913.

B 1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1913 (1913-16).

2. (1) *Making of Rules and Regulations.*—The Governor-in-Executive Committee may from time to time make rules and regulations governing the use of wireless telegraph apparatus on merchant ships, British or foreign, while in the territorial waters of this Colony.

(2) *Ratification.*—Such rules and regulations when sanctioned by both Houses of the Legislature and assented to by the Governor, shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(3) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any of these rules and regulations:

(a) The ship shall be subject to a maritime lien in favour of His Majesty the King, his heirs and successors, for a sum of one hundred pounds, and the amount so charged may be sued for and recovered in the Colonial Court of Admiralty;

(b) The ship may be detained by force if necessary by the Harbour and Shipping Master or his chief clerk, with the aid of the harbour police, until payment of the lien aforesaid or until arrested under process of the Colonial Court of Admiralty;

(c) The master of such ship shall be liable to a penalty not exceeding fifty pounds.

(d) The person committing the breach shall be liable to a penalty not exceeding fifty pounds.

3. (1) *Special Orders*.—In any case of urgency which is not provided for in the rules and regulations, the Governor may make any special order, and such order shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(2) *Penalties*.—If the master of such ship or any person on board such ship commits a breach of any special order, the ship shall be subject to the maritime lien imposed by section 2 of this Act for the amount therein mentioned and may be detained as is therein provided, and the master, and the person committing the breach, shall be liable to a penalty not exceeding fifty pounds.

AN ACT

C To amend the Wireless and Submarine Telegraph Amendment Act, 1913. (1913-16.)

Be it enacted by the Governor, Council, and Assembly of this island, and by the authority of the same, as follows:—

1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1917.

2. The Wireless and Submarine Telegraph (Amendment) Act, 1913, is hereby amended by inserting the words "and yachts" immediately after the words "merchant ships" in line three of subsection 1 of section 2 thereof,

and the word "ship" wherever occurring in the subsequent parts of the Act shall be construed as including a yacht.

3. The Regulations made under the authority of the said Act by the Governor-in-Executive Committee on the thirty-first day of July nineteen hundred and thirteen, shall apply to yachts as fully and in the same manner in all respects as they do to merchant ships.

RULES MADE BY THE GOVERNOR-IN-EXECUTIVE COMMITTEE UNDER SECTION 2 (1) OF ACT 1913-16, ON JULY 31ST, 1913, CONFIRMED AUGUST 11TH, 1914.

D 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling or (b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Secretary of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress,

GRENADA.

ADMINISTRATION.

Wireless telegraphy is regulated by the following Ordinances and regulations:—

- A**—Wireless Telegraph Ordinance.
- B**—Ordinance to amend the Wireless Telegraph Ordinance.
- C**—Ordinance to consolidate and amend the Law relating to Wireless Telegraphy.
- D**—Wireless Telegraph Ordinance, 1911 and 1913.

THE REVISED LAWS OF GRENADA. CHAPTER CXIII.

THE WIRELESS TELEGRAPH ORDINANCE

A AN ORDINANCE FOR THE MANAGEMENT BY THE GOVERNOR-IN-COUNCIL OF ALL INSTRUMENTS AND APPARATUS DESIGNED FOR THE TRANSMISSION OR RECEIPT WITHOUT THE INTERVENTION OF WIRE OR OTHER TANGIBLE CONNECTION, OF TELEGRAPHIC OR ELECTRIC MESSAGES, COMMONLY CALLED "WIRELESS TELEGRAMS," DECEMBER 15TH, 1903.

1. In this Ordinance—

The term "Wireless Telegraphy" means any system or installation, designed or constructed for the transmission or receipt of any messages or communications to or from a distant place by means of electric currents and signals generated by any apparatus or instrument which system, installation or instrument is unconnected by wire or other tangible attachment with such distant place;

The term "Wireless Telegram" means any message or communication transmitted,

or intended for transmission, by Wireless Telegraphy

2. The Governor-in-Council and the servants of the Government of the Colony shall have the exclusive privilege of installing, erecting, maintaining and using this Colony apparatus intended for Wireless Telegraphy, and also the incidental services of transmitting, receiving, collecting or delivering Wireless Telegrams.

3. It shall not be lawful for any person to instal, erect, maintain or use in this Colony any apparatus or instrument for the purpose of Wireless Telegraphy without having previously obtained from the Governor a licence in that behalf to be granted on such terms and conditions as the Governor may prescribe.

4. Any person contravening the provisions of this Ordinance shall be liable on conviction to a fine not exceeding Fifty Pounds, and the apparatus and installation in respect of which a conviction is obtained may by order of the Magistrate before whom such conviction is obtained be forfeited to the use of His Majesty the King.

5. All proceedings under this Ordinance may be taken before the Magistrate of the Southern District or any other person appointed by the Governor for the purpose of hearing and deciding the case; and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on summary conviction.

6. This Ordinance may be cited as "The Wireless Telegraph Ordinance."

AN ORDINANCE TO AMEND THE WIRELESS TELEGRAPH ORDINANCE.

JANUARY 15TH, 1923.

B Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada as follows:—

1. The Governor-in-Council may make regulations—

(a) Prescribing the form and manner in which applications for licences under the principal Ordinance are to be made and the fees payable on the grant of any such licence;

(b) Governing the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of the Colony; and

(c) Generally for the purpose of carrying the principal Ordinance into effect.

2. Any person committing a breach of any regulations made under this Ordinance shall be liable on summary conviction to a fine not exceeding Twenty Pounds.

3. (1) This Ordinance may be cited as the Wireless Telegraph Amendment Ordinance, 1913, and shall be read as one with the Wireless Telegraph Ordinance, and may be cited therewith as the Wireless Telegraph Ordinances, 1911 and 1913.

(2) The Wireless Telegraph Ordinance is herein referred to as the principal Ordinance.

Passed the Legislative Council this tenth day of January, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

I assent,

J. HAYES SADLER,
Governor.

January 15th, 1913.

AN ORDINANCE TO CONSOLIDATE AND AMEND THE LAW RELATING TO WIRELESS TELEGRAPHY. SEPTEMBER 1ST, 1923.

C Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada, as follows:—

Clauses 1 to 6 (2) are identical with those in the *Wireless Telegraph Ordinance No. 128, 1916 Revision*. Numbered therein 2 to 7 (2).

See under *St. Lucia*, p.

7. The Wireless Telegraph Ordinance, and the Wireless Telegraph Amendment Ordinance, 1913, are hereby repealed.

8. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1913.

SCHEDULE.

REGULATIONS.

See Schedule to Ordinance No. 128, 1916 Revision for *St. Lucia*, page

I assent, J. Hayes Sadler, Governor.
August 29th, 1923.

Passed the Legislative Council this fifteenth day of August, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

THE WIRELESS TELEGRAPH ORDINANCES, 1911 AND 1913.

REGULATIONS WITH RESPECT TO THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS.

(Gazetted February 1st, 1913.)

D Under the authority of section one of the Wireless Telegraph Ordinance, 1913, the following regulations are hereby made by the Governor-in-Council:—

1. In these regulations the expression "merchant ship" means any merchant ship, whether British or foreign.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such a ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Postmaster.

4. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor-in-Council this 31st day of January, 1913.

C. LIVINGSTON WILSON,
Clerk of Councils.

JAMAICA

THE Governor is assisted by a Privy Council and a Legislative Council, the latter consisting partly of nominated and partly of elected members.

ADMINISTRATION.

The laws and regulations under which radiotelegraphy is administered comprise the following :—

- A**—Telegraph Control Law, 1904.
- B**—Direct West India Cable Company's Law, 1909.
- C**—Regulations under Law of 1904.
- D**—Further Rules and Regulations.
- E**—Further Rules and Regulations (July, 1923).

THE TELEGRAPH CONTROL LAW (7) OF 1904.

A 1. No person shall, within the Colony or any of its Dependencies, establish, maintain or use any telegraphic apparatus, mechanism, or contrivance, of what nature or kind soever the same may be, without due permission or licence under the hand of the Governor previously obtained for that purpose.

It is hereby expressly declared that what is commonly known as "wireless telegraphy," including the Marconi apparatus and any similar or other mechanism or contrivance whatsoever for the transmission of telegraphic messages without the employment of wires or cables, is a telegraphic apparatus, mechanism or contrivance within the meaning of this Section.

2. It shall be lawful for the Governor in Privy Council from time to time to make and as he shall see fit repeal, alter or vary rules and regulations for all or any of the following purposes, viz :—

Permitting or licensing any person to establish, maintain, or use any telegraphic apparatus, mechanism, or contrivance, whether for the service of the public or for any private purpose ;

Attaching conditions, restrictions, and limitations to the exercise of the privilege by such permission or licence conferred :

Providing suitable penalties and forfeitures for the contravention of the prohibition above contained in Section 1 of this law, and to the breach of any rule or regulation made thereunder, and providing for the recovery thereof, summarily or otherwise ; provided that the penalty (over and above forfeitures) to be imposed for any one offence shall in no case exceed a fine of Two Hundred Pounds, or in default of payment thereof imprisonment, with or without hard labour, for a period not exceeding twelve months ;

The exercise of all such powers and control over telegraphic establishments (by temporarily entering into possession thereof or otherwise) as may be necessary for the public safety, whether at all times, or in any case of emergency which may arise.

And generally for the better carrying out of the purposes of this law.

Such rules and regulations shall come into force as from the date of publication thereof in the *Jamaica Gazette*.

3. Nothing in this law contained shall invalidate or impair any legal right already possessed by any telegraph or cable company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance, and use thereof, or any other like matter.

4. Law 1 of 1903 is hereby repealed.

LAW 21 OF 1909.**THE DIRECT WEST INDIA CABLE COMPANY'S LAW, 1909.**

B Whereas the Direct West India Cable Company, Limited, is desirous of establishing a wireless installation for communication between ships and the shore in Jamaica ;

And whereas under the provisions of Law 7 of 1904, entitled "The Telegraph Control Law, 1904," no person shall establish, maintain or use within the Island of Jamaica, or any of its Dependencies, any apparatus or machine whereby communication by wireless telegraphy can be held between the said Island and ships, without having first obtained the sanction of and a licence from the Governor.

And whereas a licence to erect such a wireless station has been granted to the Direct West India Cable Company, Limited, by the Governor of Jamaica.

Be it enacted by the Governor and Legislative Council in Jamaica as follows :—

1. The protection, rights, powers, and facilities already granted to the Direct West India Cable Company, Limited, under Law 16 of 1898, entitled "The Direct West India Cable Company's Law, 1898," are granted and extended for the purposes of wireless telegraphy installation to be installed by the company or worked and maintained by them in so far as they may be applicable to the satisfactory and efficient working and maintenance of a wireless station or stations.

2. The Government of Jamaica shall acquire for the use and at the expense of the company a piece of land of sufficient dimensions at a place to be selected by the company and approved by the Government suitable and convenient for the economical erection, maintenance, and working of the installation, and when acquired such piece of land shall be conveyed to the company in fee simple, or if the Government of Jamaica possesses a piece of land of sufficient dimensions at a place approved by the company suitable and convenient for the economical erection, maintenance, and working of the installation and which the Government considers it desirable the company should have, the Government may sell the said piece of land at a price to be mutually agreed upon, or the Government may rent it to the company on such terms as may be agreed on during the period of the licence or for so long as the company may continue to work a wireless station or stations.

The acquisition of land by the Government of Jamaica under this section shall be deemed as an acquisition for public works within the meaning of the Public Lands Acquisition Law, 1897 (Law 31 of 1897).

REGULATIONS UNDER LAW OF 1914.

C It will be noted that under Clause 2 of the Telegraph Control Law (7), 1904, the Governor in Privy Council has the power of making rules and regulations, and a set of rules were accordingly promulgated during the year 1909, under which the working of wireless telegraphy is now being administered in Jamaica. These rules read as follows:—

1. Any licence granted under Law 7 of 1904 shall only entitle the licensee to establish, maintain and use that particular class of telegraph apparatus, mechanism, or contrivance mentioned in the licence. Every licence granted under the said law shall make mention of and fully describe the particular class of telegraphic apparatus, mechanism or contrivance which the applicant proposes to establish, maintain and use.

2. Every person establishing, maintaining or using any telegraphic apparatus, mechanism or contrivance in contravention of Section 1 of the Telegraph Control Law, 1904 (Law 7 of 1904), shall be liable to penalty not exceeding two hundred pounds, or, in default of payment, to be imprisoned with or without hard labour for a period not exceeding twelve months, and the telegraphic apparatus, mechanism or contrivance so established, maintained or used shall be liable to be forfeited to the Government of Jamaica.

3. Every person licensed under this law, who uses any telegraphic apparatus, mechanism or contrivance, for which he has not a licence shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

4. Every person licensed under this law who acts contrary to the terms of this licence shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

5. Proceedings for penalty and forfeiture under these rules shall not be taken except upon the authority of the Attorney-General.

6. Proceedings for the recovery of any penalty and for any forfeiture under these rules shall be of summary nature and shall be taken before the Resident Magistrate for Kingston.

FURTHER RULES.

D Further Rules and Regulations made by the Acting Governor in Privy Council under the Telegraph Control Law, 1904, Law 7 of 1904.

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Governor.

3. These rules and regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of the wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules and regulations as may be made by the Governor from time to time, and such rules and regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these rules and regulations shall on summary conviction before a Resident Magistrate be liable to a penalty not exceeding two hundred pounds, and in default of payment to be imprisoned with or without hard labour for a period not exceeding twelve months.

FURTHER RULES AND REGULATIONS

E Made by the Governor in Privy Council under the Telegraph Control Law, 1904 (Law 7 of 1904), and published in the "Jamaica Gazette" July 25th, 1923.

ADDITIONAL RULES UNDER THE TELEGRAPH CONTROL LAW, 1904 (Law 7 of 1904).

1. Any applicant for a licence under the Telegraph Control Law, 1904 (Law 7 of 1904) shall produce evidence of his British nationality and two written references as to character. A certificate of birth should be furnished if possible; but this will not be insisted upon if the two referees testify of their own knowledge that the applicant is of British nationality. The Referees shall be persons of British birth and of standing, not related to the applicant.

2. In the case of the licensees holding a licence for experiments in wireless Telegraphy or Wireless Telephony, there shall be no divulgence to any person (other than a duly authorised officer of the Government of Jamaica or a competent legal tribunal) or any use whatever be made of any message received by means of the apparatus, except messages in connection with his experiments received from another experimental station, time signals, musical performances and messages transmitted by any station for general information.

3. The installation shall be subject to the approval of the Electrical Inspector in this Island or any other person or officer duly authorised by the Governor in that behalf as also the location where such installation is to be made.

4. The station or installation shall not be used in such a manner as to cause interference with other stations or installations. Any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be coupled with the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled with the aerial or the aerial secondary circuits over the range of wavelengths between 300 and 500 metres is similarly restricted.

5. Applicants for licences for experiments in wireless telegraphy must satisfy the electrical inspector or other person or officer appointed by the Governor as aforesaid that they have in view some definite object of scientific value, or general public utility and that they are competent to carry out experiments in wireless reception and transmission. If scientific research be intended they must be certified as

competent investigators by a competent government officer authorised in that behalf or by some recognised scientific body.

6. All licensed apparatus shall be open to inspection at all reasonable times by the electrical inspector or other person or officer appointed by the Governor as aforesaid.

7. Each sending station shall be under the charge of a person who has satisfied the electrical inspector or other person or officer appointed by the governor as aforesaid by examination or otherwise, that he has attained :—

- (a) A sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.
- (b) A knowledge of the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. Such regulations are published

and contained in the YEAR BOOK OF WIRELESS TELEGRAPHY AND TELEPHONY.

(c) An operating speed of at least 12 words (Morse) a minute, sending and receiving.

A fee of five shillings will be charged for the examination referred to above, when necessary.

8. Authority to use wireless apparatus shall not be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian who should proceed as above indicated and should, in addition, state his or her relationship to the minor. In such cases the evidence and references specified in Rule 1 of these Rules shall be furnished both in respect of the minor and of his parent or guardian.

9. A licence for experimental wireless apparatus will only be in force for a period of one year, but such licence may be renewed year by year and endorsed accordingly.

LEEWARD ISLANDS

THE Leeward Islands Colony is under one Governor, who resides at Antigua.

ADMINISTRATION.

No wireless stations exist, but wireless telegraphy would be administered under :—

A—Ordinance No. 11, 1913.

B—Regulations made thereunder in 1913, and

C—Further Regulations dated 28th August, 1917.

D—Wireless Telegraphy Consolidating Ordinance 1913 (Dominica).

Similar legislation is in force in the other islands under the same administration.

ORDINANCE No. 11 OF 1913.

ANTIGUA,

A An Ordinance to consolidate and amend the law relating to wireless telegraphy.

Be it ordained by the Governor and Legislative Council of Antigua as follows :

1. This Ordinance may be cited for all purposes as "The Wireless Telegraphy Consolidation Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) No person shall establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor-in-Council.

(2) Every such licence shall be in such form and for such period as the Governor-in-Council may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. No person shall work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Presidency, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor-in-Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and

such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor-in-Council an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this ordinance, he may grant a search warrant to any police Officer or any person appointed in that behalf by the Chief Inspector of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be

used or intended to be used for wireless telegraphy therein.

7. (1) Any person guilty of an offence against any provisions of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings under this Ordinance shall be taken on the complaint of the Chief Inspector of Police or of any person thereto authorised by him in writing.

8. Ordinance No. 12 of 1903 entitled "An Ordinance to regulate the establishment of Wireless Telegraphy" and Ordinance No. 7 of 1913 entitled "An Ordinance to amend the Wireless Telegraphy Ordinance, 1903," are hereby repealed.

Passed the Legislative Council the 14th day of October, 1913.

Dated at Antigua the 23rd day of October, 1913, in the fourth year of His Majesty's reign.

SCHEDULE—SECTION 5 (2).

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Presidency shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Presidency or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Presidency except with the special or general permission of the Governor-in-Council.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

REGULATIONS.

MADE BY THE GOVERNOR-IN-COUNCIL.

C Whereas it is provided by section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, that if at any time, in the opinion of the Governor-in-Council, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas in my opinion such emergency as aforesaid has arisen;

Now I do hereby rescind the further Regulations made under the said Ordinance on the 8th day of September, 1914, and make the following Regulations, namely:—

1. The radiotelegraph stations on board ships (other than ships requisitioned by His Majesty's Government) shall not be worked whilst such ships are within a harbour of the Presidency and for the proper enforcement of the above.

(a) Ships of British register in harbours of the Presidency must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(b) Ships of foreign register in a harbour of the Presidency must, subject to the provisions of the following sub-sections (c) take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(c) Ships of foreign register remaining in the harbour of the Presidency for less than twelve hours may at the discretion of the Governor be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of sub-section (a) of this Regulation.

2. The Governor may at his discretion direct that the operating room of any ship (other than a ship requisitioned by His Majesty's Government) in a harbour of the Presidency be sealed or order any other steps to be taken affecting the radiotelegraph station on board any such ship.

3. Every person failing to obey and conform with the provisions of these Regulations or with any directions given by the Governor under the same shall be guilty of an offence and shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council, under section 5 (3) of the Wireless Telegraph Consolidated Ordinance, 1913, this 28th day of August, 1917.

THE WIRELESS TELEGRAPHY CONSOLIDATION ORDINANCE, 1913.

REGULATIONS MADE BY THE GOVERNOR-IN-COUNCIL.

D The Regulations made by the Governor-in-Council dated 2nd day of December, 1914, are hereby rescinded and the following substituted therefore:—

1. The radiotelegraphic apparatus on board ships shall not be worked whilst such ships are within the territorial waters of this Presidency, except as is hereinafter provided.

2. The Governor may appoint any persons to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Presidency.

Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty and use the same for His Majesty's service and subject thereto for such ordinary services as to the said person may seem fit.

4. For the proper enforcement of the above the person so appointed may—

(a) Require the master of any ship being within the territorial waters of the Presidency to completely disconnect the aerial wires from the radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected, or

(b) Take down the aerial wires completely and disconnect the same from the radio telegraphic apparatus.

(c) Seal up the radiotelegraphic cabin on any ship, and the seal on such cabin shall not be broken without the consent of such person while the ship is within the territorial waters of the Presidency.

5. The master of any ship who shall refuse or fail to carry out any instructions given by a person appointed as aforesaid or shall obstruct any such person in the enforcement of these regulations, or shall break any seal shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council this 10th day of July, 1917.

R. B. SKINNER,
Acting Clerk of Council.

SAINT LUCIA (See Map 45).

CONTROL AND ORGANISATION.

THE wireless station situated on the Morné Fortuné overlooking the capital was erected by the Admiralty in 1915, and was maintained and controlled by that department until January, 1922, when it was transferred to the local Government and re-opened for commercial work in August, 1922.

ADMINISTRATION.

Wireless telegraphy is administered under an Ordinance No. 128, 1916 Revision and Regulations issued on its authority.

A—Wireless Telegraphy Ordinance, No. 128, 1916 Revision.

B—Regulations thereunder.

WIRELESS TELEGRAPHY ORDINANCE.

NO. 128, 1916 REVISION.

A This Ordinance may be cited as the Wireless Telegraphy Ordinance.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraphy station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far

as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the Chief of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon

such conviction, the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the First District Court on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof; and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. The Governor may appoint any person to take possession and control of the apparatus

for wireless telegraphy on board of any merchant ship while in the territorial waters of the Colony.

5. Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty, and use the same for His Majesty's Service, and subject thereto for such ordinary services as to the said person may seem fit.

6. Any such person may instead of taking possession of such apparatus as aforesaid direct the master of the ship to submit or cause to be submitted to him all messages intended for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him, and generally to obey all such directions with reference to the transmission of messages as such person may prescribe, and the master of the ship shall obey and conform to all such directions. Any master failing to obey and conform to any such direction shall be liable on summary conviction to the penalties provided under the Ordinance.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

ST. VINCENT

ADMINISTRATION.

NO wireless stations exist in this Colony, but wireless telegraphy would be administered under an Ordinance and Regulations which figure below.

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations.

ORDINANCE.

A This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

Clauses 2 to 7 (1) are identical with those in the *Wireless Telegraph Ordinance No. 128, 1916 Revision* in force in the Island of St. Lucia (see page 152) except that Clause 5 reads "The Governor in Council may from time to time" Clause 7 (2) reads:—

(2) Proceedings shall be taken before the Police Magistrate of the First District on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. "The Wireless Telegraph Ordinance 1904," and "The Wireless Telegraph Amendment Ordinance, 1912," are hereby repealed.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony, except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of

any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the

person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Regulations made by the Governor in Council on the 17th day of December, 1912, under the authority of the Wireless Telegraphy Ordination, 1904 and 1912, are hereby repealed.

TRINIDAD

THE Colony of Trinidad is administered by a Governor, assisted by an executive Council and Legislative Council.

CONTROL AND ORGANISATION.

The Trinidad and Tobago Government Wireless Service is a branch of the Public Works Department and under the control of the Director of Public Works.

ADMINISTRATION.

The Laws and Regulations governing radiotelegraphy are reprinted below:—

A—Ordinance No. 6 of 1917.

B—Regulations.

ORDINANCE No. 6 OF 1917.

ISSUED MAY 8TH, 1917.

A Be it enacted by the Governor of Trinidad and Tobago with the advice and consent of the Legislative Council thereof as follows:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1917.

2. (1) It shall not be lawful for any person to use or establish in this Colony any apparatus or installation for the purposes of wireless telegraphy, without first obtaining from the Governor a licence in that behalf, to be granted on such terms and conditions as the Governor may from time to time prescribe.

(2) Any person contravening the provisions of this section is liable on summary conviction before a Magistrate to a fine not exceeding £50 or to imprisonment with or without hard labour, for any term not exceeding six months, and the apparatus and installation in respect of which a conviction is obtained may by order of the convicting magistrate be forfeited to the use of His Majesty the King.

3. (1) No person shall work any apparatus for wireless telegraphy installed on any merchant ship whilst this ship is in the territorial waters of the colony, otherwise than in accordance with regulations made in that behalf by the Governor in Executive Council.

(2) Such regulations shall be published in the *Royal Gazette*.

(3) Any person contravening, or permitting, procuring, or assisting in the contravention of, any such regulations is liable, on summary conviction before a magistrate, to a penalty not exceeding £50, or to imprisonment, with or without hard labour, for any term not exceeding six months.

4. Any person who unlawfully and maliciously:—

(a) Injures, removes or destroys any apparatus or installation for the purpose of wireless telegraphy, or any part of such apparatus or installation; or

(b) Obstructs or prevents in any manner whatsoever the sending, conveyance or delivery of any message or signal by wireless telegraphy;

is guilty of a misdemeanour and is liable to imprisonment, with or without hard labour, for any term not exceeding two years.

5. The Wireless Telegraph Ordinance (No. 236) and the Wireless Telegraphy Ordinance 1909 are hereby repealed.

Passed in Council this twenty-seventh day of April, in the year of Our Lord one thousand nine hundred and seventeen.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1917.

MERCHANT SHIPS IN TERRITORIAL WATERS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony should be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be worked so as not to interrupt, or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. Subject to the provisions of the preceding Regulation, ships at anchor in the harbours of Port-of-Spain, San Fernando and Brighton may use their wireless apparatus for the purpose of sending and receiving messages to or from the Port-of-Spain Wireless Station, only in accordance with the following conditions:

(a) Messages will be accepted at the Port-of-Spain Wireless Station for transmission to ships at a special rate of two cents per word with a minimum of twelve words.

(b) Masters' service messages will be accepted at the Port-of-Spain Wireless Station from ships for delivery by telephone with confirmatory copy at the foregoing rates: Provided that the power radiated by such ships shall not exceed one quarter of an ampere on a 600 metre wavelength and that the radiated wave shall be sufficiently sharply tuned to avoid interference with stations working on any other wavelength.

(c) All charges made under this Regulation shall be payable at the Port-of-Spain Wireless Station.

3. No apparatus for wireless telegraphy on board a merchant ship at anchor in any harbour of the Colony shall be worked or used for the purpose of communicating with any other ship without the special or general permission of the Director of Public Works first had and obtained.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the Public Service that His Majesty's Government or the Government of this Colony should have control over the transmission of

messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Executive Council.

5. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

6. The regulations made under the Wireless Telegraphy Ordinance, 1917, on June 12th, 1919, are hereby revoked.

Made by the Governor in Executive Council this 11th day of January, 1923.

J. M. FARFAN,

Acting Clerk of the Council.

BULGARIA

(See Maps 3, 14, and 16)

BULGARIA is a Sovereign State under the Czar Boris III.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Michail Savoff	Director-General of Posts, Telegraphs and Telephones.	Sofia.

As far as is known only four fixed stations exist. Their working is in conformity with the Radiotelegraphic Convention of London.

CANADA

(See Maps 36 and 37)

Including the Provinces of Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon and the North-West Territories.

THE control of radiotelegraphy and telephony in Canada is now as set out in the following notice :—

NOTICE.—Effective 1st July, 1922, the administration of the Radiotelegraph Act has been transferred from the Department of the Naval Service to the Department of Marine and Fisheries. Wherever the term "Naval Service" appears in the Radiotelegraph Act and Regulations issued thereunder, or in the licences for radiotelegraph stations, the term "Marine and Fisheries" is to be substituted therefor.

On and after the above date all communications regarding the administration of radiotelegraphy and radiotelegraph licenses should be addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

Ottawa, 3rd July, 1922.

ORGANISATION.

According to the latest available information there are 23,280 radio telegraph and telephone installations, classified as follows :—

Coast Stations	32
Licensed Limited Coast Stations	1
Licensed Ship Stations	211
Licensed Public Commercial Stations	7
Licensed Private Commercial Stations	51
Licensed Private Commercial Broadcasting Stations	30
Licensed Experimental Stations	32
Licensed Amateur Experimental Stations	10,444
Licensed Amateur Broadcasting Stations	14
Licensed Private Receiving Stations	11,845
Licensed Radiotelegraph Training Schools	8
Government Land Stations	1
Direction Finding Stations	4

In order to provide for the proper control and supervision of Amateur classes of stations, 29 part-time Inspectors have been appointed in the more important cities and towns of the Dominion.

ADMINISTRATION.

Previous to 1913, radiotelegraphy in the Dominions was regulated by Part 4 of the Telegraph Act. This is now replaced by the Radiotelegraph Act, assented to on the 6th June, 1913. A copy of the Radiotelegraph Act and Regulations issued thereunder, with all amendments to date, is attached hereto. The complete regulations so far as they concern amateur working are at present under revision. The new conditions brought about by broadcasting are also being brought within their scope.

Effective 1st July, 1922, the administration of the Radiotelegraph Act has been transferred from the Department of the Naval Service to the Department of Marine and Fisheries.

A—Radiotelegraph Act, 1913.

B—Radio Regulations (Revised to 1st June, 1923). Part I.

C—Radio Regulations Revised to 1st June, 1923). Part II.

D—Extract from Air Regulations, 1919.

E—Limited Coast Station Licence (W42).

F—Public Commercial Licence (W18).

G—Private Commercial Licence (W43).

H—Private Receiving Licence (W68).

I—Ship Licence (W19).

J—Training School Licence (W66).

K—Amateur Experimental Licence (W44).

L—Amateur Broadcasting Licence (W70).

M—Experimental Broadcasting Licence (W20).

N—Private Commercial Broadcasting Licence (W69).

3 & 4 GEORGE V., CHAP. 43.

AN ACT RESPECTING RADIOTELEGRAPHY STATUTES.

ASSENTED TO 6TH JUNE, 1913.

A His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as the Radiotelegraph Act.

2. In this Act, unless the context otherwise requires—

(a) "Minister" means the Minister of the Naval Service (now Marine and Fisheries);

(b) "Radiotelegraph" includes any wireless system for conveying electric signals or messages including radiotelephones;

(c) "Coast station" means any radiotelegraph station which is established on land or on board a ship permanently moored and which is used for the exchange of messages and electric signals with ships at sea;

(d) "Land station" means any radiotelegraph station or installation of radiotelegraphic apparatus which is not a coast station or a ship station;

(e) "Ship station" means any radiotelegraph station established on board a ship which is not permanently moored.

3. No person shall establish any radiotelegraph station or install or work any radiotelegraph apparatus in any place in Canada or on board any ship registered in Canada except under and in accordance with a licence granted in that behalf by the Minister.

4. From and after the first day of January, nineteen hundred and fourteen, no passenger steamer, whether registered in Canada or not—

(a) Licensed to carry fifty or more persons, including passengers and crew, and going on a voyage which is or which includes a voyage of more than two hundred nautical miles from one port or place to another port or place; or,

(b) Licensed to carry two hundred and fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than ninety nautical miles from one port or place to another port or place; or,

(c) Licensed to carry five hundred or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than twenty nautical miles from one port or place to another port or place

shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred nautical miles by night and by day, and in charge of a person fully qualified to take charge of and operate such apparatus.

2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section shall, on summary conviction, be liable to a fine not exceeding one thousand dollars and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

(3) This section shall not apply to passenger steamers plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the Northumberland Straits, or on the Georgian Bay, or on the lakes of Canada other than Lakes Ontario, Erie, Huron and Superior,

and the provisions of paragraph (c) of sub-section 1 of this section shall not apply to steamers making voyages on Lakes Ontario, Erie, Huron and Superior, the regular route for which is not at any point more than seven miles from the shore.

(4) This section shall not apply to steamers calling at Canadian ports solely for the purpose of obtaining bunker coal or provisions for the use of such steamer, or through stress of weather, or for repairs.

5. All persons operating land or cable telegraph lines shall transmit all messages destined to or coming from ship stations via coast stations under such rules as may be made by the Board of Railway Commissioners for Canada.

6. No one shall be employed as a radiotelegraph operator at any coast or land station unless he is a British subject, and all radiotelegraph operators at shore or land stations, or on ship stations on board any vessel registered in Canada, shall take and subscribe a Declaration of Secrecy in the form set forth in the Schedule to this Act, before a judge of any court, a notary public, a justice of the peace or a commissioner for taking affidavits, having authority or jurisdiction within the place where the oath is administered.

(2) Every person who has made the Declaration of Secrecy and who, either directly or indirectly, divulges to any person, except when lawfully authorised or directed so to do, any information which he acquired by virtue of his employment, is guilty of an offence and shall be liable on summary conviction to a penalty not exceeding one hundred dollars and to imprisonment for a term not exceeding six months.

7. Any person who sends or transmits or causes to be sent or transmitted any false or fraudulent distress signal, message, call or radiogram of any kind, or who without lawful excuse interferes with or obstructs any radio-communication, shall be guilty of an offence and shall be liable on summary conviction to a penalty not exceeding five hundred dollars and costs or six months imprisonment.

8. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a radiotelegraph station has been established without licence in that behalf, or that any apparatus for radiotelegraphy has been installed or worked in any place or on board any ship registered in Canada within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Minister and named in the warrant.

(2) A warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any radiotelegraph apparatus which appears to him to be there used or intended to be there used for radiotelegraphy.

9. Every one who establishes a radiotelegraph station or installs or works any radiotelegraph apparatus in violation of the provisions of this Act, or of any regulation made hereunder, shall be liable on summary conviction to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars and to imprisonment for a term not exceeding twelve months, and in either case shall be liable to forfeit to His Majesty, any radiotelegraph apparatus installed or worked without a licence.

(2) No proceedings shall be taken against any person under this section, except by order of the Minister.

10. The Governor in Council may—

- (a) i. Prescribe the tariff of fees to be paid for licences and for examination for certificates of proficiency held and issued under the provisions of this Act;
- ii. Authorize the payment of a portion of the licence fees collected in respect of certain prescribed licences to a provincial government, private company, or other prescribed party, and, notwithstanding anything to the contrary in any Act, to any Department or employee thereof, for services given in connection with the operation of broadcasting stations and for services performed for the Minister in connection with the licensing and inspection of stations.
- (b) Accede to any international convention in connection with radiotelegraphy, and make such regulations as may be necessary to carry out and make effective the terms of such convention and prescribe penalties recoverable on summary conviction for the violation of such regulations; provided that such penalties shall not exceed five hundred dollars and costs;
- (c) Make regulations for the censorship and controlling of radiotelegraph signals and messages in case of actual or apprehended war, rebellion, riot or other emergency.

11. The Minister may make regulations—

- (a) Prescribing the form and manner in which applications for licences under this Act are to be made;
- (b) Classifying ship, coast and land stations and prescribing the type and range of the regular equipment and the emergency equipment to be installed in the several classes of stations;
- (c) Defining the different kinds of licences that may be issued, their respective forms and the several periods for which they shall continue in force;
- (d) Prescribing the conditions and restrictions to which the several licences shall respectively be subject;
- (e) Prescribing the different classes of certificate of proficiency and the class of certificate necessary to qualify persons as operators for the several classes of ship, coast and land stations;
- (f) For the examination of persons desiring to obtain certificates of proficiency as radiotelegraph operators and to determine the qualifications in respect of age, term of service, skill, character and other wise to be required for such certificates;
- (g) Prescribing the watches to be kept by operators and the number of operators to be maintained and kept at the different classes of ship, coast and land stations;
- (h) For the inspection of radiotelegraph stations;
- (i) To provide how radiotelegraph apparatus installed upon any foreign or British ship (whether such British ship is registered in Canada or elsewhere) shall be operated while such ship is within the territorial waters of Canada;
- (j) To compel all radiotelegraph stations to receive, accept, exchange and transmit signals and messages with such other radiotelegraph stations and in such manner as he may prescribe.
- (k) For the effective carrying out of the provisions of this Act.

(2) The Minister may, by regulation, authorise the imposition of a penalty not exceeding fifty dollars and costs or three months' imprisonment for the violation of any regulation made under this section, and any such penalty may be recovered upon summary conviction.

12. All regulations made under the provisions of the two sections immediately preceding shall be published in *The Canada Gazette*, and shall be laid before both Houses of Parliament within ten days after the publication thereof if Parliament is then sitting, and if Parliament is not then sitting, then within ten days after the next meeting thereof.

13. His Majesty may, at any time, assume, and for any length of time retain, possession of any radiograph station and of all things necessary to the sufficient working thereof, and may, for the same time, require the exclusive service of the operators and other persons employed in working the same; and the person owning or controlling the station shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders and transmit and receive such signals, calls and radiograms as they are required to receive and transmit by any duly authorised officer of the Government of Canada.

(2) If the Minister and the person owning or controlling any radiotelegraphic station taken possession of by the Crown under the provisions of this section cannot agree as to the compensation to be paid by the Crown for such taking possession, the Minister shall refer the matter to the Exchequer Court of Canada for adjudication.

14. Part IV of the Telegraphs Act is repealed.

SCHEDULE.

DECLARATION OF SECRECY.

I, A. B. solemnly and sincerely promise and declare that I will faithfully and honestly fulfil the duties which devolve upon me as radiotelegraphic operator, and that I will not, either directly or indirectly, divulge to any person, except when lawfully authorised or directed so to do, any information which I acquire by virtue of my employment as such operator, or which may come to my knowledge through the operation of any radiotelegraphic installation.

Declared before me at

this day of 19
[Signature of Declarant.]

RADIO REGULATIONS.

Revised to 1st June, 1923.

PART I.

APPROVED BY THE GOVERNOR IN COUNCIL AND ISSUED IN ACCORDANCE WITH SECTION 10 OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

B

FEES FOR LICENCES.

1. The annual fees to be paid in respect of licences issued by the Minister of Marine and Fisheries for the installation and operation of radiotelegraph stations in the Dominion of Canada, or on board any ship registered in Canada, shall be as follows:—

1. Limited Coast station	\$50.00
2. Public Commercial station	50.00
3. Private Commercial Broadcasting station	50.00
4. Private Commercial station	10.00
5. Experimental station	5.00
6. Amateur Broadcasting station	5.00
7. Amateur Experimental station	1.00
8. Private Receiving station	1.00
9. Technical or Training School station	5.00
10. Ship station	1.00

FEES FOR EXAMINATIONS.

2. The fees to be paid in respect of examinations for "Certificates of Proficiency in Radiotelegraphy and Radiotelephony" shall be as follows, for each examination or re-examination:—

1. Extra First-class certificate	\$5.00
2. First-class certificate	2.50
3. Second-class certificate	1.00
4. Third-class certificate	1.00
5. Experimental certificate	2.50
6. Amateur certificate .. ..	.50
7. Emergency certificates, any class	5.00
8. Radiotelephone certificate	2.50

LONDON CONVENTION.

3. (i) The provisions of the International Radiotelegraph Convention of London, 1912, and of the regulations annexed thereto, shall be observed by all "coast stations" established in Canada, and by all "ship stations" on board any vessel registered in Canada.

(ii) *Penalty.*—Any person who installs or works any radiotelegraph apparatus at any of the above-mentioned stations in violation of this regulation, shall be liable on summary conviction to a fine not exceeding five hundred dollars (\$500) and costs.

CONTROL OF STATIONS IN CASE OF EMERGENCY.

4. (i) *Coast and Land Stations.*—If, and whenever in the opinion of the Minister an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the apparatus of any coast or land station, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause so much of the apparatus, as is within Canada or the territorial waters thereof, or any part of the apparatus, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and subject thereto for such ordinary services as to the said Minister may seem fit, and in that event, any person, authorised by the said Minister, may enter upon the stations, offices and works of any coast or land station or any of them and take possession thereof and use the same as aforesaid.

(ii) The Minister may, when he considers such an emergency as aforesaid to have arisen, instead of taking possession of such coast or land station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly and in such manner as he may direct, and such persons may enter upon the station premises accordingly, or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

(iii) The Minister may, when he considers such emergency as aforesaid to have arisen, close any coast or land station and cause the removal therefrom of the apparatus or any part thereof.

5. (i) *Ship Stations.*—If, and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient for the public Service that the Government shall have control over the transmission of messages by

the apparatus of a radiotelegraph station on board any Canadian registered vessel, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause the apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and, subject thereto, for such ordinary services as to the said Minister may seem fit, and in that event any person authorised by the said Minister may enter upon any ship station and take possession thereof and use the same as aforesaid.

(ii) When the Minister considers such an emergency as aforesaid to have arisen, he may, instead of taking possession of such ship station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly, and in such manner as he may direct, and such persons may enter upon the station premises accordingly or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

RADIO REGULATIONS.

Revised to 1st June, 1923.

PART II.

ISSUED BY THE MINISTER OF MARINE AND FISHERIES IN ACCORDANCE WITH SECTION II OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

LICENCES.

1. *Nationality of Licensees.*—Licences for "Transmitting stations" are issued only to British Subjects or to companies incorporated under the laws of the Dominion of Canada or any of the Provinces thereof.

Licences for "Private Receiving Stations" are issued to any person in Canada irrespective of nationality.

2. *Issue of Licences.*—Licences for "Private Receiving Stations" are issued by the Department of Marine and Fisheries, Ottawa, by Departmental Radio Inspectors, and by the Postmasters of the larger towns and cities in the Dominion of Canada.

Licences for all other classes of stations are issued by the Department of Marine and Fisheries, Ottawa, only.

Applications for Licences for other than "Private Receiving Stations" should be made on the form "Application for Licences" provided for that purpose, copies of which may be obtained directly from the Department or from any Departmental Radio Inspector.

2 (a) Applications for Licence to install and operate any of the following classes of stations for radiotelephony in the Province of Manitoba will, under arrangement between the Dominion and Provincial Governments, be submitted to the Minister of Telephones of the Province of Manitoba for endorsement before being finally dealt with by the Department of Marine and Fisheries:—

Public Commercial Station,
Private Commercial Station,
Private Commercial Broadcasting Station
Amateur Broadcasting Station.

3. *Classes of Licences.*—Licences for the following classes of stations may be issued:—

Coast Stations—

Limited Coast Station.

Land Stations—

Public Commercial Station,
Private Commercial Broadcasting Station,
Private Commercial Station,
Experimental Station,
Amateur Broadcasting Station,
Amateur Experimental Station,
Private Receiving Station,
Technical or Training School Station.

Ship Stations—

Ship Station.

4. *Duration of Licences.*—Licences will be valid for one year, commencing on April 1st and expiring on March 31st of the following year. All licences issued during the year automatically expire on March 31st, unless otherwise specified in the licence.

5. *Limited Coast Licences.*—Limited coast licences may be granted with respect to stations in localities not served by a regular Government coast station; such stations will be allowed to undertake a limited correspondence with ships at sea determined by the object of such correspondence. They must exchange public messages with such ships, coast and land stations, as are designated in the licence, but with no other stations whatsoever.

For ship to shore working they must be operated in accordance with the provisions of the International Radiotelegraph Convention, and they must use such wavelengths as are specified in the licence.

The watches to be maintained and the number and class of operators to be carried are to be as specified in the licence, the regular form of which is annexed hereto (Form No. W. 42).

6. *Public Commercial Licences.*—Public commercial licences may be granted to land stations open for public correspondence with certain other land stations designated in the licence.

The wavelengths to be used, the watches to be maintained and the number and class of the operators to be carried are to be specified in the licence, the regular form of which is annexed hereto (Form No. W. 18).

Public commercial licences are also granted to receiving stations established for purposes of gain, such as receiving stations installed in theatres, halls, etc., for the purpose of giving radiotelephone concerts and for which an admission charge is made. The regular form of licence is annexed hereto (Form No. W. 18).

7. *Private Commercial Broadcasting Licences.*—Private commercial broadcasting licences may be granted to land stations to be operated for the broadcasting by radiotelegraph or radio telephone of news, information, entertainment or other service.

No tolls shall be levied or collected on account of any service performed by this class of station.

The working of the station must be strictly limited to the hours prescribed in the licence and the station must use such wavelength as is specified therein.

The station must be operated by a person who is the holder of a "First Class" or a "Radio telephone" Certificate of Proficiency in Radio.

The regular form of the private commercial broadcasting licence is annexed hereto (Form No. W. 69).

8. (i) *Private Commercial Licences.*—Private commercial licences may be granted to land stations to be operated in connection with the private correspondence of the licensee. Such stations will be limited to certain specific services which will be defined in the licence. Such

stations shall not exchange messages with stations other than those specified in the licence, and except in the special case provided for in Section (ii) of this regulation, no tolls shall be levied or collected on account of any business transacted, or messages sent to or from the station. This class of station must use such wavelengths as are specified in the licence. The watches to be maintained and the number and class of operators to be carried shall be as specified in the licence, the regular form of which is annexed hereto (Form No. 43).

• (ii) In the case of private commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Minister may prescribe that the licensed station must accept messages to and from the public, and communicate with such stations as may be designated. In this event, the licensee shall be entitled to collect a toll for the handling of such public correspondence, the amount of such toll to be as approved by the Board of Railway Commissioners and as specified in the licence.

(iii) The Minister at his discretion may authorise the licensed station to communicate with certain specified ship stations when such ship stations are within certain areas or localities to be specified in the licence. Messages handled with such ships must be limited exclusively to the business of the licensee and no coast station charge shall be levied in respect of such messages.

9. *Experimental Licences.*—Experimental licences will be granted to stations intended for purely experimental purposes and operated with a view to the advancement of the art of radio. Applicants for such licences must state their technical attainments and the general lines on which they propose to pursue their investigations. It should be observed that the fact that the applicant desires to conduct experiments with his equipment frequently does not justify or require a licence of this class, as most experiments can be conducted within the limitations of an "Amateur Experimental Licence" or by the use of an artificial aerial.

In addition to the provisions contained in the regular form of experimental licence annexed hereto (Form No. W. 20) the following special regulations will apply to all experimental stations.

SPECIAL REGULATIONS FOR EXPERIMENTAL STATIONS.

10. Applicants for an experimental licence must state in their application the wavelength or wavelengths they desire to use. The normal wavelengths for experimental stations are 175 metres spark and 275 metres C.W., and radiotelephone. In addition the licensee is authorised to use for special work such other wavelengths as are prescribed in the licence.

11. When transmitting on wavelengths of 275 metres or less the station must be worked by a person holding an "Amateur Experimental" or a higher grade of Certificate of Proficiency (see Regulation No. 97), and when transmitting on wavelengths greater than 275 metres it must, if it be within the range of any commercial or coast station, be worked by a person holding either a "First Class," "Second Class," or "Experimental" Certificate of Proficiency in Radiotelegraphy (see Regulations Nos. 93, 94 and 96).

12. The power used, measured at the terminals of the transformer, or generator, will normally be limited to $\frac{1}{2}$ kW.

In special cases, however, such as that of a commercial company desirous of testing and

demonstrating apparatus, or of stations so far removed from any commercial station or route of navigation as to preclude any possibility of interference, the Minister may at his discretion permit the use of greater powers than $\frac{1}{2}$ kW.

13. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the licence.

14. A distinctive call signal will be allotted to each station, commencing with the figure 9, e.g., 9AA, etc. This signal is to be transmitted twice at the termination of every transmission.

15. The regulations of the International Radiotelegraph Convention must, where applicable, be observed at the station.

16. The station, when operating, must listen for the signal "STP" which will indicate that an experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, experimental stations will absolutely cease to operate until the Government station gives the signal "Cancel STP."

17. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken.

18. When a licensed station is located near a commercial station it must be provided with a connection with the local telephone exchange so that prompt communication may be established in case of interference.

19. *Amateur Broadcasting Licences.*—Amateur Broadcasting Licences may be granted to recognised radio associations. They will not be granted to individuals. Such licences will permit broadcasting on a wavelength of 250 metres at the hours and for the periods prescribed in the licence.

The normal range of amateur broadcasting stations will be limited to 25 miles.

An association licensed to operate an amateur broadcasting station may, subject to the approval of the Minister, authorise a station belonging to one of its members to broadcast on its behalf, such station whilst broadcasting shall use the call signal and wavelength allotted to the association. The association will be held responsible for the proper operation of the station in accordance with the provisions of the licence and the radio regulations.

20. *Amateur Experimental Licences.*—Amateur experimental licences may be granted to small stations used for instruction, amusement or experimental purposes.

In addition to the provisions contained in the regular form of amateur experimental licence annexed hereto (Form No. W. 44), the following special regulations will apply to all amateur experimental stations:—

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.

21. The normal transmitting wavelengths for amateur experimental stations are as follows:—

Spark, 175 metres.
Continuous wave and radiotelephone,
150, 175, 200 and 225 metres.

The power used, measured at the terminals of the transformer or generator, must not exceed $\frac{1}{2}$ kW.

22. Amateur experimental stations must be so operated as not to interfere with the working of any Government or commercial, coast, land or ship station. In the event of interference by an amateur experimental station the Department will limit the power and wavelength authorised for such station. In the event of continued interference by an amateur experimental station the department will cancel the licence issued for such station.

23. The station must be worked by a person holding an amateur experimental certificate of proficiency (see Regulation No. 97).

24. (a) The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the licence.

(b) The use of plain aerial or other untuned highly damped spark transmitters is not allowed.

25. A distinctive call signal will be allotted to each station, commencing with a figure, e.g., 3AA, etc., which signal must be sent not less than three times at the termination of every transmission.

26. The regulations of the International Radiotelegraph Convention must, where applicable, be observed by the station.

27. Broadcasting by amateur experimental stations is not permitted (see Regulation 19 for Amateur Broadcasting Licence).

28. The station, when operating, must listen for the signal. On receipt of the "STP" signal, all amateur experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

29. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

30. When the licensed station is in the vicinity of a commercial station it should be connected with the local telephone exchange so that instant communication may be established in case of interference.

31. *Private Receiving Licences.*—Private receiving licences will be granted for stations to be established for "reception only" and which are not used for the purpose of gain.

Receiving stations when using a receiver of the regenerative type for the reception of organised radiotelephone programmes must avoid increasing regeneration to the point at which the receiver begins to oscillate.

32. *Technical and Training School Licences.*—Technical and training school licences will be granted to stations intended for educational purposes; they will be afforded every facility for the work they propose to undertake compatible with any special local conditions such, as the existence of a Government or commercial station in their vicinity; in general they will be subject to the same conditions as experimental stations and amateur experimental stations.

The regular form of the licence is annexed hereto. (Form No. W. 66).

33. (a) *Ship Station Licences.*—Ship station licences will be granted to stations on British ships registered in Canada.

The regular form of the licence is annexed hereto. (Form No. W. 19.)

(b) The Minister may require as a condition to the issue of any Licence to be granted by him under the authority of this Act that the Licensee shall pay to the Minister, and maintain throughout the period during which licence or any renewal thereof is in force, a deposit of \$50.00 as security for the payment of coast station and landline delivery charges in respect of radiotelegrams originating on board any vessel in respect of which the licence is issued and transmitted *via* any coast station, domestic or foreign, which deposit may be appropriated by direction of the Minister for the payment of any such charges which are not otherwise paid in due course and shall be returned at the expiry of nine months from the termination of the licence subject to such deductions as shall have been made for payment of any of the charges aforesaid.

CLASSIFICATION OF SHIP STATIONS.

Ship Stations will be classified as follows :—

34. *Class 1.*—All "sea-going" passenger vessels registered in Canada with an average speed of 15 knots or more, carrying 50 or more persons and plying between ports more than 200 miles apart; also all "sea-going" passenger vessels registered in Canada with an average speed of 13 knots or more, carrying 200 or more persons and plying between ports more than 500 miles apart.

35. *Class 2a.*—All "sea-going" passenger vessels registered in Canada affected by the provisions of Section 4 of the Radiotelegraph Act, which do not come under Class 1.

Class 2b.—All vessels registered in Canada plying on "coasting voyages" or on the "inland waters" of Canada which are affected by the provisions of Section 4 of the Radiotelegraph Act.

36. *Class 3.*—All vessels registered in Canada, not affected by the provisions of Section 4 of the Radiotelegraph Act, but which have been voluntarily equipped with radiotelegraph apparatus.

The terms "sea-going," "coasting voyage," and "inland waters" are to be as defined in Section 72 of the Canada Shipping Act, Chapter 113, R.S. 1906.

REGULAR EQUIPMENT.

37. *Vessels in Class 1.*—The regular radiotelegraph equipment must have a minimum range of 100 nautical miles at all hours of the day and night with a similar equipment on a similar vessel and with all Canadian Government coast stations.

38. The normal wavelength of the emitted wave must be 600 metres; in addition the set must be capable of being operated on a wavelength of 300 metres, and means are to be provided whereby a quick change-over from one wavelength to the other may be effected.

39. In the case of small vessels on which it is materially impossible to use a transmitting wavelength of 600 metres, 300 metres may be employed; such ship stations, however, must be fitted with a receiver capable of tuning up to a 600 metre wavelength and the watches must be maintained on that wavelength.

40. The logarithmic decrement of a complete oscillation must not exceed two-tenths (0.2).

41. The power used by the transmitter, measured at the terminals of the generator of the station, must not, under normal circumstances, exceed 1 kw., except in the special case provided for in Article 35, paragraph 2, of the International Radiotelegraph Convention of London, 1912.

42. In the case of equipments using a power of more than 50 watts, an arrangement must be provided whereby several ranges, each less than the normal range, may be speedily obtained, the shortest range being, approximately, 15 nautical miles.

43. The use of "plain aerial" except in cases of distress or in installations using a power of less than 50 watts, is prohibited.

44. *Vessels in Class 2.*—Regulations No. 37 to No. 43, inclusive, shall apply to the equipments on vessels in Classes 2a and 2b.

45. *Vessels in Class 3.*—Regulations No. 38 to No. 43, inclusive, shall apply to equipments on vessels in Class 3.

EMERGENCY EQUIPMENTS.

46. *Class 1.*—Every vessel in Class 1 must carry an emergency source of power, instantly available, which shall be capable of operating the equipment for six hours, under normal conditions, with a minimum range of 80 nautical miles.

47. *Class 2.*—Vessels in Classes 2a and 2b must carry a similar source of power with the exception that the minimum normal range of the equipment is reduced to 50 nautical miles.

48. *Class 3.*—Vessels in Class 3 will not be required to carry emergency sets.

49. *Emergency Equipments Generally.*—(1) The emergency equipment in its entirety must in all cases be placed in the upper part of the ship, as high as practicably possible and in a position of the greatest safety.

(2) The emergency equipment may take the form of complete transmitter. Storage battery sets, of sufficient capacity to operate the regular radiotelegraph equipment of the vessel for the specified time, are, however, strongly recommended.

(3) A plain aerial transmitter may be installed as an emergency equipment, provided (subject to the provisions of Regulation No. 43) the use of the same is confined exclusively to distress calls.

(4) Regulations No. 46 to No. 49, inclusive, will become effective on and after December 1st, 1914.

50. *Spare Parts.*—Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

51. *Certificate of Inspection.*—The radiotelegraph installation on all British vessels registered in Canada will be subject to inspection by an officer of the Department of Marine and Fisheries at least once a year, who, if the apparatus is found to comply with the terms of the Radiotelegraph Act and the regulations issued thereunder, shall issue to the vessel a "Radiotelegraph Inspection Certificate" certifying that the equipment has been duly inspected and that it complies with the provisions of the licence issued therefor by the Minister of Marine and Fisheries, such certificate to be posted in the radiotelegraph cabin.

52. *Time.*—Radiotelegraph stations on vessels plying on the West Coast shall observe Pacific time, and those on the Great Lakes and East Coast Eastern Standard time.

WATCHES.

53. *Vessels in Class 1.*—A constant watch must be maintained at the radiotelegraph stations on all vessels in Class 1 (Regulation No. 34) whilst they are en route, and two operators, holding first-class certificates, must be carried on such vessels.

54. *Vessels in Class 2a.*—A constant watch from 8 a.m. to 3 p.m. and a watch during the first ten minutes of every other hour of the day must be maintained at the radiotelegraph stations on all vessels in Class 2a (Regulation No. 35) whilst they are en route; the ten-minute watch may be maintained by an operator holding a "Second-class Certificate of Proficiency," or by a person holding a regular "Third-class Certificate."

55. *Vessels in Class 2b.*—Watches as herein-after specified in Regulations No. 57 to No. 67, must be maintained at the radiotelegraph stations on all vessels in Class 2b, whilst they are en route.

56. (1) *Vessels in Class 3.*—No fixed watches need be maintained at radiotelegraph stations on vessels in Class 3 (Regulations No. 36) when plying on a coasting voyage or on the Great Lakes on the runs specified in Regulations 57 to 62.

(2) Vessels in Class 3 plying on transoceanic voyages, and carrying one operator, must keep watches as specified in Regulation 56a.

56a. Vessels carrying one operator, and plying on runs not covered by Sections 57 to 62, must whilst en route maintain watches as follows:—

Belt A.—East Atlantic and European.

From Long. 30° W. to Long. 30° E.,
including Baltic, Mediterranean and
Black Seas.
0800 to 1000
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt B.—Indian Ocean.

From Long. 30° E. to Long. 90° E.,
including Red Sea and Persian Gulf;
0000 to 0200
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt C.—Australasian (Western).

From Long. 90° E. to Long. 160° E.
0000 to 0200
0400 to 0600
1200 to 1400
2000 to 2200

Belt D.—Australasian (Eastern).

From Long. 160° E. to Long. 140° W.
 0000 to 0200
 0400 to 0600
 0800 to 1000
 2000 to 2200 G.M.T.

Belt E.—East Pacific.

From Long. 140° W. to the Western
 Coast of America, thence southward
 along Long. 70° W.
 0000 to 0200
 0400 to 0600
 1600 to 1800
 2000 to 2200 G.M.T.

Belt F.—West Atlantic.

From Eastern Coast of America, and
 Long. 70° W. (South of Cape Horn)
 to Long. 30° W.
 0000 to 0200
 1200 to 1400
 1600 to 1800
 2000 to 2200 G.M.T.

PACIFIC COAST.

57. *Class 2b—Local Coasting Runs.*—Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and not steaming for more than 16 hours in any day, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m. and the last half-hour of every hour until 8.00 p.m.

9.30 p.m. to 10.00 p.m.

11.30 p.m. to 12.00 midnight.

3.30 a.m. to 4.00 a.m.

5.30 a.m. to 6.00 a.m.

In the case of vessels affected by Subsection (c) of Section 4 of the Radiotelegraph Act (500 persons—ports more than 20 miles apart), the above watches need only be kept whilst the boats are en route between ports more than 20 miles apart.

58. Vessels in Class 2b, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 57, with the exception that a watch may be maintained from 1.30 a.m. to 2.00 a.m. instead of from 3.30 a.m. to 4.00 a.m., and no watch need be kept between the hours of 2.00 a.m. 9.30 a.m.

59. *Class 2b—Coasting Vessels Plying North and South.*—Vessels in Class 2b plying on runs between ports in British Columbia south of Queen Charlotte Sound and ports in the same province north of that Sound, or *vice versa*, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m.

10.30 a.m. to 11.00 a.m.

1.30 p.m. to 2.00 p.m.

4.30 p.m. to 5.00 p.m.

7.30 p.m. to 8.00 p.m.

10.30 p.m. to 11.00 p.m.

If, during these periods, the vessel is in the immediate vicinity of any place mentioned in the lists given in Regulations 60 and 61, communication must be established with the coast station shown, or should the vessel reach such vicinity out of the above periods the ship station must call such coast station until communication is established or it becomes out of range.

60. *North Bound:*—

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Gonzales Hill	Trial Island	Trial Island
Point Grey	The First Narrows or Abeam Porlier Pass	The First Narrows or Abeam Porlier Pass.
Cape Lazo	Abeam	Cape Mudge.
Alert Bay	Cape Mudge	
"	Blinkensop Bay	Abeam.
"	Abeam	Pine Island.
"	Pine Island	
Triangle Island	Egg Island	Egg Island.
"	Before reaching Harold Point	Before reaching Harold Point.
"	Ivory Island	Ivory Island.
Digby Island	Vancouver Rock	
"	Watson Rock	Watson Rock.
"	Abeam	Abeam.
"	Hodgson Island	
"	Pointers	Pointers.

61. South Bound :—

Station.	LOCALITY.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Digby Island	Pointers	Pointers.
"	Hodgson Island	"
"	Abeam	Abeam.
"	"	"
Triangle Island ..	Lawyer Island	Lawyer Island.
"	Vancouver Rock	Vancouver Rock.
"	Ivory Island	"
"	Harold Point	Harold Point.
"	Egg Island	Egg Island.
"	Pine Island	Pine Island.
Alert Bay	"	"
"	Abeam	"
"	Blinkensop Bay	Blinkensop Bay.
Cape Lazo	Chatham Point	"
"	Abeam	Abeam.
Point Grey	Sisters	Sisters.
"	Abeam	Abeam.
Gonzales Hill	Active Pass	Active Pass.

GREAT LAKES AND EAST COAST.

62. *Class 2b—Vessels Plying on the Great Lakes and on Coasting Voyages on the East Coast.*—Vessels in Class 2b plying on voyages of more than 300 miles between terminal ports on the Great Lakes or East Coast must maintain watches whilst en route as follows :—

7.00 a.m. to 7.30 a.m.

10.00 a.m. to 10.30 a.m.

1.00 p.m. to 1.30 p.m.

4.00 p.m. to 4.30 p.m.

7.00 p.m. to 7.30 p.m.

10.00 p.m. to 10.30 p.m.

Communication must also be established with each coast station when abeam, irrespective of whether such position is reached during the above periods or not.

63. Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between terminal ports and not steaming for more than 16 hours out of the 24, must maintain watches whilst en route as follows :—

8.00 a.m. to 8.30 a.m. and the first half-hour of every hour until 8.30 p.m.

10.00 p.m. to 10.30 p.m.

12.00 p.m. to 12.30 a.m.

4.00 a.m. to 4.30 a.m.

6.00 a.m. to 6.30 a.m.

64. Vessels in Class 2b, plying on voyages of less than 300 miles but more than 50 miles between ports and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 63, with the exception that 2.00 a.m. to 2.30 a.m. is substituted for 4.00 a.m. to 4.30 a.m., and no watch need be kept between the hours of 2.30 a.m. and 10.00 a.m.

66. Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and not steaming more than 10 hours out of the 24, must, whilst en route, maintain a constant watch.

67. Vessels in Class 2b plying on voyages of less than 50 miles between terminal ports and steaming for more than 10 hours in the 24, must, whilst en route, maintain watches as prescribed in Regulation No. 64.

OPERATION.

68. *Power Available.*—Power for the operation of the main equipment shall be available during the periods a watch is being maintained under Regulations No. 53 to No. 67.

69. *Control of Ship Stations.*—The operation of the radiotelegraph station on any vessel shall be under the supreme control of the master of such vessel.

70. *Censorship by the Master of a Vessel.*—The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radiotelegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

71. *Form W. 40.*—A copy of Form W. 40 must be posted in every radiotelegraph station; these forms may be obtained from the Deputy Minister of the Naval Service on request.

72. *Secrecy of Messages.*—(a) No message shall be delivered, or its contents divulged, to any person except the addressee, his or her accredited agent, or such properly authorised persons as are essential for the forwarding of such message to its destination.

(b) Any person who makes any use of any message or the contents thereof which has been delivered or divulged to him or her in violation of Regulation No. 72 (a), shall be liable on summary conviction to the penalty prescribed for the violation of these regulations.

73. *Superfluous Signals.*—The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

74. *Profane Language.*—No person shall transmit or make a signal containing profane words or language.

OPERATORS.

75. *Operators.*—The apparatus of all coast, land or ship stations, other than private receiving stations, must only be worked by persons holding regular Certificates of Proficiency in Radio, and who have subscribed to a Declaration of Secrecy, as prescribed in Section 6 of the Radiotelegraph Act.

76. *British Subjects.*—All operators on coast, ship or land stations must be British Subjects, and the different classes of stations must be worked by operators holding Canadian "Certificates of Proficiency" (subject to the provision of Section 77) not inferior to those hereinafter prescribed in Regulations No. 80 to 86, for the respective classes of stations.

77. *Ship Stations.*—The holders of Certificates of Proficiency in Radio issued in accordance with the provisions of the International Radiotelegraph Convention by His Majesty's Postmaster-General, the Administration of any British self-governing Dominion or Colony, or the Government of India, will (subject to the provisions of these regulations) be entitled to act as radio operators on any Canadian vessel so long as operators holding Canadian certificates are accorded similar privileges in respect of vessels belonging to such administrations.

78. *Certificates of Proficiency.*—The following Certificates of Proficiency in Radio are issued by the Department:—

Ship Stations—

- (1) First Class Certificate,
- (2) Second Class Certificate,
- (3) Third Class (Watcher's) Certificate,
- (4) Emergency Certificate,
- (5) Radiotelephone Certificate.

Land and Coast Stations—

- (6) Extra First Class Certificate,
- (7) First Class Certificate,
- (8) Second Class Certificate,
- (9) Third Class Certificate,
- (10) Emergency Certificate,
- (11) Radiotelephone Certificate,
- (12) Experimental Certificate,
- (13) Amateur Experimental Certificate.

79. *Emergency Certificates.*—In case of emergency in which it is impossible for an operator to attend a regular examination, the Minister may hold an emergency examination and shall have power to issue emergency certificates of any class. Such certificates shall not be valid for more than six months.

Any person holding an emergency certificate of proficiency must promptly apply for permission to attend an examination as provided by Regulation 87, and when notified of the date and place of examination he is hereby further required to attend a regular examination for a certificate of proficiency within the requirements of Regulations 89 to 97 inclusive, and the said emergency certificate shall expire and cease to be of effect on the day on which the result of such regular examination is published.

OPERATORS TO BE CARRIED.

80. *Ships in Class 1.*—Ships in Class 1 must carry two operators holding First-class Certificates.

81. *Ships in Class 2a.*—Ships in Class 2a must carry two operators, one First-class and one Second-class, or one First-class and one Third-class.

82. *Ships in Class 2b.*—Ships in Class 2b must carry one First-class operator.

83. *Ships in Class 3.*—Ships in Class 3, if they undertake public correspondence, must carry one First-class operator, or, if their service is limited exclusively to the ship's business, one Second-class operator.

84. *Coast Stations.*—(1) All public coast stations open for public correspondence and maintaining a constant watch must carry three operators, each of whom must hold a Canadian First-class Certificate of Proficiency. The Minister shall, however, have power in special cases to permit the employment of other persons on such stations for the purpose of maintaining the constant watch above mentioned, provided such persons are capable of transmitting and receiving in the Morse Code at a speed of twenty words a minute, as prescribed in Sub-sections (a) and (b) of Regulation No. 89 and provided the station is in charge of an operator holding a First-class Certificate of Proficiency.

(2) The regulation will become effective on and after the 1st of January, 1915.

85. All other coast stations shall carry such operators holding such certificates as are specified in the licence issued for the station under Regulation No. 4.

86. *Land Stations.*—Land stations (commercial, experimental, etc.) shall carry such operators holding such certificates as are specified in the licence issued for the station under Regulations Nos. 6, 7, 8, 9, 19, 20 or 32, according to the classification of the station.

EXAMINATION FOR RADIOTELEGRAPH CERTIFICATES OF PROFICIENCY.

87. *Applications.*—Applications for permission to attend examinations for any certificate of proficiency must be made to the Deputy Minister of the Naval Service on the special form provided for that purpose (W. 13). The date and place of examination will be notified to the candidate as soon as possible after receipt of the application.

PERSONS ELIGIBLE TO ATTEND EXAMINATIONS

88. (a) No person shall be permitted to attend examination for any of the following classes of Certificates of Proficiency in Radio:—

Ship Stations—

- First Class Certificate,
- Second Class Certificate,
- Third Class (Watcher's) Certificate,
- Emergency Certificate,
- Radiotelephone Certificate.

Land and Coast Stations—

- Extra First Class Certificate,
- First Class Certificate,
- Second Class Certificate,
- Third Class (Watcher's) Certificate,
- Emergency Certificate,
- Radiotelephone Certificate,

- (i) Who is not a natural born British Subject;
- (ii) Who has at any time been of enemy nationality;
- (iii) Whose parents or either of them have at any time been of enemy nationality.

Provided, however, that any naturalised British Subject who has not or whose parents or either of them have not at any time been of enemy nationality may be admitted to examination if his application be approved by the Minister of the Department of Marine and Fisheries.

(b) Candidates for examination for first-class Certificates of Proficiency must not be less than eighteen years of age.

(c) For the purpose of this regulation a person shall be deemed to be of enemy nationality if he has at any time been the subject of a state with which Great Britain has been at war within the period of ten years immediately preceding the 15th day of October, A.D. 1919.

SHIP STATIONS.

89. *First-class Certificate.*—Candidates for first-class certificates will be examined in the following subjects:—

- (1) Transmission and reception at a speed of twenty words a minute;
- (2) Adjustment care and operation of apparatus;
- (3) The regulations applicable to the exchange of radiotelegraphic traffic.

The examination will consist of two sections "Practical" and "Written":—

"Practical" Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at not less than the prescribed speed (viz., twenty words a minute, five letters being counted as one word); the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account.

(b) To receive and write legibly for no less than five consecutive minutes at the prescribed speed from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraph reception.

(c) To connect up the apparatus with the help of a diagram of connections.

(d) To name the principal parts of the apparatus.

(e) To mention the most common faults which develop in the apparatus of the set in which he is being examined and the means usually taken to remedy them.

(f) To trace, locate, and remedy several such faults.

(g) To adjust the apparatus after it has been placed out of adjustment.

(h) To change the wavelength of the transmitter from 300 to 600 metres and *vice versa*.

(i) To reduce or increase the transmitting power.

"Written" Section.

(j) To complete a diagram of connections of the set in which the candidate is being examined.

(k) To answer seven technical questions on the equipment, including storage battery and emergency set, if any.

(l) To answer nine questions on the methods of handling radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications as set out in the latest edition of the British Postmaster-General's Handbook and the service regulations annexed to the International Radiotelegraph Convention in force; the questions will also include the counting, checking and computation of tolls on three test messages. The candidate will also be required to have a thorough knowledge of the use of the "C.P.R.," "Western Union," and "C.N.T." tariff books and the "Official List of Radiotelegraph Stations"

issued by the International Telegraph Bureau. Given these books, he will be required to compute the charges on a test message from any ship *via* any Canadian coast station to any telegraph office in the world.

90. *Second-class Certificate.*—Candidates for second-class certificates must pass a satisfactory examination on all the subjects prescribed for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute. Holders of this certificate will only be allowed to operate stations on ships in Classes 2a and 3, as specified in Regulations Nos. 81 and 83.

91. *Third-class Certificate.*—Third-class (Watcher's) certificate will authorise the holder to work at one station only, the name and call signal of which will be designated in the certificate.

The examination will be practical and *viva voce* and the candidate will be required:—

(1) To distinguish from other signals the call signal of the station designated in the certificate, when it is repeated several times, at the rate of ten words a minute;

(2) To distinguish from other signals the distress call "SOS" when it is repeated several times, at the rate of ten words a minute;

(3) To adjust the receiver for incoming signals on the wavelength normally used;

(4) To test the detector with a buzzer or other testing appliance and to adjust it for the efficient reception of signals on the normal wavelength.

COAST AND LAND STATIONS.

92. *Extra First-class Certificate.*—Candidates for Extra First-class Certificates, in addition to taking a thorough examination on the subjects set out in sections (c) to (l) of Regulation No. 89, will be required:—

"Practical" Section.

(a) To send and receive in the International Morse Code for five minutes at a speed of not less than twenty-five words a minute, under the conditions prescribed in sections (a) and (b) of Regulation No. 89;

(b) To trace, locate and remedy faults in standard radiotelegraph installations, of not less than five kilowatt power, including valve detector, gasoline engines, D.C. and induction motors and to adjust the same for efficient operation.

(c) The practical use of a wavemeter.

"Written" Section.

(d) To answer seven questions on the principles governing the working of radiotelegraph installations, internal combustion engines and dynamo electric machinery, as used in connection with radiotelegraph installations;

(e) To answer seven questions on the International Radiotelegraph Convention and regulations annexed thereto, the Regulations issued by the Minister of Marine and Fisheries and the procedure governing the obtaining of bearings from Direction Finding stations, the general organisation of a radiotelegraph service, including the procedure followed in connection with the transfer of business to and from land lines and the handling of radiotelegraph abstracts and accounts.

The holder of an extra first-class certificate will be authorised to operate on any Canadian coast, land or ship station.

* The "Postmaster-General's Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section may be obtained from the Department of Marine and Fisheries, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

93. *First-class Certificate.*—The examination for the first-class coast certificate will be similar in all respects to that for the first-class ship station certificate, with the exception that the candidate will be required to have a knowledge of the care and operation of gasoline engines.

94. *Second-class Certificate.*—The examination for the second-class coast certificate will be similar to that for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute.

95. *Third-class Certificate.*—The examination for the third-class coast certificate will be similar to that for the third-class ship certificate.

96. *Experimental Certificate.*—Candidates for an experimental certificate will be required:—

“Practical” Section.

(a) To send on an ordinary radiotelegraph key for five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word; the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account;

(b) To receive and write legibly for not less than five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word, from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraphic reception, and to distinguish the signals “SOS,” “STP,” and his own call signal from among other signals, when sent at a speed of twenty words a minute;

(c) To reduce the transmitting power;

(d) To change the wavelength of the transmitter within the limits prescribed in the licence issued for the station;

(e) To adjust the apparatus after it has been placed out of adjustment.

“Written” Section.

(f) To complete a diagram of connections of the set in which the candidate is being examined;

(g) To answer seven technical questions on the equipment, including storage battery and emergency set, if any;

*(h) To answer nine questions on the procedure governing the handling of radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications, particularly as set out in part 5, sections 60 to 91 of the Postmaster-General's Handbook for Wireless Telegraph Operators, section 6, articles 20 to 35 of the regulations annexed to the International Radiotelegraph Convention, and the Minister's Regulations applicable to the operation of experimental stations.

*97. *Amateur Experimental Certificate.*—Candidates for an amateur certificate will be examined in the adjustment and operation of the apparatus they propose to operate and will be required to have a satisfactory knowledge of the Departmental regulations governing the working of amateur experimental stations

*The Postmaster General's “Handbook for Wireless Telegraph Operators” and the “International Radiotelegraph Convention of London” referred to in this section, may be obtained from the Department of Marine and Fisheries, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

(Regulations Nos. 19 to 31), and those annexed to the International Radiotelegraph Convention of London, applicable to the working of stations generally, particularly section 6, articles 20 to 35, entitled “Transmission of Radiotelegrams.”

The examination will be practical and *viva voce*, and the candidates will be required to send and receive in the International Morse Code at a speed of not less than ten words a minute and to distinguish from other signals the signals “SOS,” “STP” and the call signal of his station, when repeated several times at a speed of ten words a minute.

EXAMINATIONS GENERALLY.

98. *Places at which examinations will be held.*—Examinations will generally be conducted at the Department of Marine and Fisheries, Ottawa; special arrangements will, however, be made where circumstances permit for holding an examination at any radiotelegraph station or any technical school of telegraphy at which suitable apparatus is provided for the purpose.

99. The certificates of proficiency will indicate the system or systems of radiotelegraphy under which the candidate's examination was conducted.

100. *Failure to Pass.*—In case of failure a candidate will not ordinarily be re-examined until after the lapse of three months. An additional fee will be payable in respect of the further examination.

101. *Suspension of Certificate.*—Should it be proved to the satisfaction of the Minister that the holder of a “Certificate of Proficiency” has wilfully or negligently failed to comply with the provisions of the International Radiotelegraph Convention and Regulations, or of these regulations, or of any other regulations which may be issued from time to time for his guidance, the certificate may, at the discretion of the Minister, be suspended or cancelled.

INSPECTION OF STATIONS.

102. *Inspection.*—Any duly authorised officer of the department may, from time to time, and at all reasonable times, enter upon any coast, land or ship station within the jurisdiction of Canada for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such station, also the working and uses of such apparatus and telegraphic instruments, and all books and papers used in connection with the operation of such station. His authority will be in the form of a letter signed by the Deputy Minister of the Department of Marine and Fisheries.

OPERATION OF SHIP STATIONS WITHIN THE TERRITORIAL WATERS OR HARBOURS OF CANADA.

103. *Ship Stations in Territorial Waters.*—The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked while such ships are within the Territorial Waters of Canada, unless specific permission is granted therefor by the controlling Canadian coast stations for the locality, and then only provided such working does not interfere with the operation of any coast station established in Canada, and that the provisions of the Radiotelegraph Convention of London, 1912, and the Service Regulations annexed thereto are strictly observed.

104. *Ship Stations in Harbours.*—(a) The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked whilst such ships are within a harbour of the Dominion of Canada, except as follows:—

(i) When direct communication by messenger, visual signals or other method between ship and shore is impracticable and then only for the purpose of exchanging with the nearest coast station messages relating exclusively to the business of the ship.

(ii) For the purpose of making or answering signals of distress.

(b) For the proper enforcement of the above, ships in Canadian harbours shall, if so instructed by a Canadian Government Radiotelegraph Inspector, or other properly authorised officer, completely disconnect the aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, in such a manner as to show they are properly disconnected.

105. *Penalty.*—Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

EXTRACT FROM AIR REGULATIONS, 1919.

D 110. "No person shall install or work a radiotelegraph or telephone apparatus in any aircraft primarily registered in Canada, except in accordance with the terms of a licence granted by the Minister of the Naval Service, and no person shall work any radiotelegraph or telephone apparatus on any aircraft, except in accordance with the provisions of the International Radiotelegraph Convention and the Service Regulations annexed thereto."

W. 42.

LIMITED COAST STATION LICENCE

Licence No.

Call Signal.

E DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radio coast station situated at

for the term of one year commencing on the first day of April, 19 and terminating on the thirty-first day of March, 19, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of fifty dollars (\$50), being the licence fee for the privilege above named.

This licence is subject to the Act and Regulations above referred to and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of

Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and "International Radiotelegraph Convention" means the International Radiotelegraph Convention and Regulations annexed thereto specified in the schedule.

2. (i) The licensee shall not establish, install, or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The use of the licensed apparatus shall, except in cases of distress, be limited to the exchange of messages with such stations, vessels or lines of vessels as are specified in the schedule.

(iii) No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada.

3. The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radio stations established as aforesaid on land and radio stations established on ships at sea.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day), as may be specified by the Minister.

8. Subject to the provisions of this licence the licensee shall transmit and receive messages by means of the licensed apparatus to and from any other station or to and from any ship without regard to the particular system of radio installed at such other station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

9. (i) The licensee shall, subject to the priority classification prescribed by the International Radiotelegraph Convention, transmit all messages in the order in which they are received, provided if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages, and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

10. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of form No. W. 40 issued by the Department of Marine and Fisheries.

12. A proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

13. The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister, at such times and in such manner as the Minister shall direct, all sums which shall be due from the licensee under such accounts.

14. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

15. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

16. The licensee shall install the apparatus at the station mentioned in the schedule, and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation continuously during the hours specified in the schedule, until this licence shall expire.

17. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificates of Proficiency as are specified in the schedule annexed hereto.

18. The licensee shall observe at the said station the provisions of the "Radiotelegraph

Act" and those of the International Radiotelegraph Convention and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

19. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

20 (a). Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

21. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

22. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

23. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

Special provisions applicable to the licensed station.

1. Name of station
2. Location
3. Latitude and longitude
4. Call signal
5. Normal range
6. System of radio
7. Type of aerial
8. Characteristics of transmitter
9. Characteristics of receiver
10. Decrement per complete period
11. Wavelength (normal underlined)
12. Source of power
13. Maximum power taken by transmitter
14. If A.C., number of cycles
15. Hours of service

16. Coast charge :—
 Per word
 Minimum per message
 17. Operators to be carried on station :—
 First class
 Second class
 Third class
 18. Total charge (ship and coast to apply
 on outward messages only) :—
 Per word
 Minimum per message
 19. Stations with which the licensed station
 may communicate

Deputy Minister of Marine and Fisheries.
 Department of Marine and Fisheries, Ottawa.
 Dated this day of 19

W. 18.

PUBLIC COMMERCIAL LICENCE.

F 19.. Licence No. Call Signal
 DEPARTMENT OF MARINE AND FISHERIES
 DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
 resident of
 hereinafter called the licensee, is hereby
 licensed to establish and operate a radio-
 land station situated at

for the term of one year
 commencing on the first day of April
 and terminating on the thirty-first day of
 March , and to install and operate
 at such station the apparatus mentioned in
 the schedule hereto, on payment of the sum
 of Fifty Dollars (\$50), being the licence fee
 for the privilege above-named.

This licence is subject to the said Act and
 Regulations and to the following terms, con-
 ditions and restrictions :—

1. In this licence, the following words and
 expressions shall have the several meanings
 hereinafter assigned to them unless there
 be something, either in the subject or context,
 repugnant to such construction, that is to
 say :—

The term "Minister" means the Minister
 or the Deputy Minister of the Department of
 Marine and Fisheries for the time being, the
 term "Radio" means and includes "Radio-
 telegraph" and "Radiotelephone," and the
 expression "Marine Signalling" means signalling
 by means of any system of radio between two or
 more ships, between ships and any coast station,
 or between two Government coast stations.

2. The licensee shall not establish, install
 work any apparatus for radio except the
 apparatus hereinafter called "the licensed
 apparatus," specified in the said schedule
 hereto, nor shall wavelengths other than those
 mentioned therein be employed.

3. The working of the licensed station shall
 be limited to the exchange of messages
 with such coast and land stations as are
 specified in the schedule.

4. No tolls, fees, or other consideration
 shall be received, levied, or collected by the
 licensee until the same have been approved
 of by the Board of Railway Commissioners
 for Canada.

5. The licensee shall so work the licensed
 apparatus as not to interfere with the working
 of any radio station established in Canada

by any Department of His Majesty's Govern-
 ment, or with the marine signalling on the
 waters or territory of Canada or neigh-
 bouring waters or territory.

6. The licensee shall comply with all such
 directions and observe all such rules as may be
 given or made by the Minister, from time to
 time, for the purpose of preventing interference
 with the working of any other radio station and
 for enabling the messages exchanged by means
 of the licensed apparatus to be distinguished
 from those emanating from any other radio
 station.

7. The licensee shall, if so required in writing
 by the Minister, cease to use the licensed
 apparatus for such period (not exceeding
 hours in any one day) as may be
 specified by the Minister.

8. The equivalent logarithmic decrement of
 the emitted waves shall not exceed that pre-
 scribed in the schedule.

9. The licensed apparatus shall not, without
 the consent of the Minister, be altered or modified
 in respect of any of the particulars mentioned
 in the schedule hereto.

10. (i) The licensee shall transmit all messages
 in the order in which they are received, provided
 that if and whenever any Department of the
 Government shall require the licensee, his
 servants or agents, to transmit by means of
 the licensed apparatus, any messages on His
 Majesty's Service, such messages shall have
 priority over all other messages, and the licensee,
 his servants and agents, shall, as soon as reason-
 ably may be, transmit the same, and shall, until
 transmission thereof, suspend transmission of
 all other messages.

(ii) The licensee shall not be entitled to
 claim any compensation in respect of the
 suspension of the transmission of messages
 as aforesaid.

11. The licensee shall not divulge to any
 person (other than properly authorised
 officials of the Government or a competent
 legal tribunal) or make any use whatever of
 any message coming to the knowledge of the
 licensee and not intended for receipt by means
 of the licensed apparatus, nor shall he divulge
 to any person other than the addressee or his
 accredited agent the contents of any message
 coming to his knowledge intended for receipt
 by means of the licensed apparatus. The
 licensee shall exhibit at the said station a copy
 of Form No. W.40, issued by the Depart-
 ment of Marine and Fisheries.

12. (i) A proces verbal of all signals trans-
 mitted, giving date, time and nature of such
 signals shall be kept by the licensee, also such
 further particulars as the Minister shall from
 time to time reasonably require. The licensee
 shall preserve all proces verbaux for such
 period as is from time to time prescribed by
 the Minister, and such papers shall be open to
 the inspection of the Minister or his officers
 thereto authorised at the office of the licensee
 in between the hours of 10 a.m.
 and 5 p.m. on every day except Sunday or a
 public holiday.

(ii) The licensee shall make a detailed
 return of the messages handled by the
 licensed station during each month on the
 forms provided for that purpose, and shall
 forward the same to the Minister at the
 end of each month.

13. The Minister or his authorised officers
 may, from time to time and at all reasonable
 times, enter upon the herein licensed station,
 for the purpose of inspection, and may inspect
 any apparatus fixed or in use in such station,

for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time, made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators and other employees of the licensee at the said station shall be British subjects, and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19 (a). Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries, and may be served by sending the same by registered post letter to the office of the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

Special provisions applicable to the licensed station.

SCHEDULE.

1. Name of station.....
2. Location.....
3. Call signal.....
4. Normal range:—
5. System of radio.....
6. Type of aerial.....
7. Characteristic of transmitter.....
8. Characteristics of receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths.....
11. Source of power.....
12. Maximum power taken by transmitter..
13. If A.C., number of cycles.....
14. Hours of service.....
15. Charges:—
Per word.....
Minimum per message.....
16. Operators to be borne on station.....
First class.....
Second class.....
Third class.....
17. Station with which the licensed station must communicate.

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 43.

PRIVATE COMMERCIAL LICENCE.

G 19 Licence No.
Call Signal.....

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of herein-after called the licensee, is hereby licensed to establish and operate a radio land station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars (\$10), being the licence fee for the privilege above-named.

This licence is subject to the said Act and regulations, and to the following terms, conditions, and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "Marine Signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. The station (except in special cases provided for in Sections (ii) and (iii) Radio Regulation, No. 8, shall be worked solely for the transmission and reception of messages appertaining to the service or affairs of the licensee and no tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any business or messages handled by the licensed apparatus.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other Radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by the licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station;

(b) With respect to any alteration of messages which the Minister may think necessary; and

(c) Generally with respect to avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. (i) The licensee shall transmit all messages in the order in which they are received, provided that if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants, and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

12. (i) A proces verbal of all messages and signals transmitted, giving date, time and nature of such messages and signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may from time to time, and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators at the said station shall be British subjects and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers

and authorities hereinbefore granted and thereupon these presents and the said licences, powers, and authorities, and each and every of them shall absolutely cease, determine and become void.

19. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radio-communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal
4. Normal range :—
Day
- Night
5. System of radio
6. Type of aerial
7. Characteristics of transmitter
8. Characteristics of receiver
9. Decrement per complete oscillation
10. Wavelength (normal underlined)
11. Source of power
12. Rating of station Generator
13. Maximum power taken by transmitter and voltage
14. Hours of Service
15. Charges :—
Per word
- Minimum per message
16. Operators to be borne on station :—
First class
- Second-class
- Third class
17. Stations with which the licensed station must communicate

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W 68 (Est'd. May, 1922).

PRIVATE RECEIVING LICENCE.

H Radiotelegraph No.....
Branch Year 192....192....

LICENCE TO OPERATE A RADIO RECEIVING EQUIPMENT.

(Issued under the Radiotelegraph Act, Statutes, 1913, Chapter 43.)

.....
(Christian names in full) Surname).

is hereby licensed to operate a radio receiving equipment of

.....
(Street and number)

.....
(Province)

This licence shall be in force from the day of the date hereof, until 31st day of March next, unless sooner forfeited.

Received the sum of one dollar (\$1.00) licence fee this.....day of.....A.D. 192

A. JOHNSTON,
Deputy Minister, Department of
Marine and Fisheries.
Countersigned.....

ORIGINAL
To be handed
to Licensee.

SECRECY OF MESSAGES.

1. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

This does not apply to broadcasted concerts or programmes addressed to the General Public.

Regulation 105. Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

NOTICE.

Irregular working and infractions of the radio regulations by transmitting stations should be immediately reported to the Director of Radio, Department Marine and Fisheries, Ottawa.

When using a receiver of the regenerative type for the reception of radiotelephone programmes, please avoid increasing regeneration to the point at which the receiver begins to oscillate, otherwise you will cause interference with neighbouring receiving equipments.

W. 19 SHIP LICENCE.

I 19.. Licence No.
 Call Signal

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

Class Ship Station.

The herein named resident of herein-
after called the licensee, is hereby licensed to establish and operate a radio station on board the vessel for the term of one year commencing on the first day of April, nineteen hundred and

and terminating on the thirty-first day of March nineteen hundred and
and to install and operate at such stations the apparatus mentioned in the schedule hereto on payment of the sum of one dollar (\$1), being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and "International Radiotelegraph Convention" means the International Radiotelegraph Convention and Regulations annexed thereto specified in the schedule.

2. (i) The licensee shall not establish, install or operate any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The ship station shall be of such class mentioned in Regulations Nos. 34, 35 or 36 of the Minister's Regulations, as is specified in the said schedule annexed hereto.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed the maximum fixed by the International Radiotelegraph Convention.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

6. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule, except in cases of distress.

7. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

8. Subject to the provisions of this licence, and in accordance with the regulations issued from time to time by the Minister, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship station without regard to the particular system of radio installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise, provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the

order of transmission of such other messages shall be governed by the International Telegraph Regulations.

9. (i) The licensee shall, subject to the priority classification prescribed by the International Radiotelegraph Convention, transmit all messages in the order in which they are received, provided if and whenever any Department of the Government shall require the licensee, his servants or agents, to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages, and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

10. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any messages coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus, and the licensee shall exhibit at the said station a copy of Form No. W.40, issued by the Department of Marine and Fisheries.

11. A proces verbal of all signals transmitted giving date, time and nature of such signals shall be kept by the licensee also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

12. (i) The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister at such times and in such manner as the Minister shall direct all sums which shall be due from the licensee under such accounts.

(ii) The licensee shall if required pay to the Minister and maintain throughout the period during which this licence is in force a deposit of \$50 as security for the payment of coast station and landline delivery charges in respect of radiotelegrams originating at the licensed station and transmitted via any coast station, domestic or foreign, which deposit may be appropriated by direction of the Minister for the payment of any such charges which are not otherwise paid in due course and shall be returned at the expiry of nine months from the termination of the licence subject to such deductions as shall have been made for payment of any of the charges aforesaid.

13. The Minister or his duly authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed ship station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving

messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and use of such apparatus and telegraphic instruments.

14. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and International Radiotelegraph Convention and detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

15. (i) The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Minister, the British Postmaster-General or the corresponding authorities of any self-governing British colony or the Government of India, and the licensee shall provide for the working of the station such operators as are required by the provisions of Regulations Nos. 80, 81, 82 or 83 of the Minister's Regulations according to the classification of the station as specified in the schedule annexed hereto.

(ii) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued in accordance with the International Radiotelegraph Convention, specified in the schedule hereto.

16. The licensee shall carry on the ship on which the ship station is established under this licence a properly certified copy of such licence, and shall produce such copy for inspection if required so to do by the duly authorised officials of the countries where the ship calls, and the following documents:—

Radiotelegraph Act and Regulations issued thereunder;

International Radiotelegraph Convention and Regulations;

Postmaster-General's Handbook for Wireless Telegraph Operators;

Official list of Radiotelegraph Stations;

Official list of Call Signals;

C.P.R., G.N.W. or Western Union Tariff Book;

Adequate supply of telegraph forms; and also such other documents as may be prescribed by the Minister, for the purpose of enabling the licensee to communicate with coast and ship stations in accordance with the rules and regulations of the International Radiotelegraph Convention.

17. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

18. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of

radio, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

19. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

20. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

21. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa, Can.

SCHEDULE.

GENERAL.

1. International Radiotelegraphic Convention of
2. Name of Ship
3. Registered in
4. Owner
5. Classification
6. Apparatus operated by
7. Call signal
8. Nature of service
9. Watches to be maintained
10. Operators to be borne on station—
First class
- Second class
- Third class
11. Ship charge—
Per word
- Minimum per message

MAIN APPARATUS.

12. Normal range
13. System of radio
14. Type of aerial
15. Transmitting wavelength (normal underlined)
16. Source of power
17. Maximum taken by transmitter
18. Decrement per complete oscillation
19. Characteristics of transmitter
20. Characteristics of receiver

EMERGENCY APPARATUS.

21. Normal range
22. Wavelength
23. Source of power and capacity of same
24. Type of transmitter

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 66.

TRAINING SCHOOL LICENCE.

Licence No.

Call Signal.

J DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed

to establish and operate a radio Training School situated at _____ for the term of one year commencing on the first day of April, 19____, and terminating on the thirty-first day of March, 19____, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5), being the licence fee for the privilege above-named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "Radio" means and includes "Radiotelegraph" and "Radiotelephone," and the expression "Marine Signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. (i.) The licensee shall not establish, install or operate any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The licensee shall work the licensed apparatus solely for the purpose of instruction in radio and for no other purpose whatever.

3. The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radio station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

5. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

6. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

7. The Minister or his officers, may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

8. The licensed apparatus shall not, without the consent of the Minister be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

9. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any

International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

10. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. No person shall operate or work the receiving apparatus at the licensed school who has not subscribed to, and filed with, the Minister of Marine and Fisheries, a Declaration of Secrecy as prescribed in Section 6 of the Radiotelegraph Act, and Radiotelegraph Regulation No. 72. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

11. At least one of the instructors at the licensed school shall be the holder of a First-class Canadian Certificate of Proficiency in Radio. Other instructors, teaching in one or two subjects only, must have passed a successful examination in the subject or subjects, with which they propose to deal; the papers for this examination and the percentage of marks to be obtained will be as prescribed for the examination for a First-class Canadian Certificate of Proficiency in Radio.

12. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

13. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

14. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period as may be specified by the Minister.

15. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every one of them shall absolutely cease, determine and become void.

16. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission

of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever, upon such terms as he shall, in his discretion, think fit.

17. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries Ottawa.

SCHEDULE.

1. Name of station
2. Location
3. Call signal
4. Type of aerial
5. Transmitting wavelength
6. Decrement per complete oscillation
7. Characteristics of transmitter
8. Characteristics of receiver
9. Source of power
10. Maximum power to be taken by transmitter
11. If A.C., number of cycles
12. Hours during which the station must not transmit
13. Stations with which the licensed station may communicate

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this day of 19

W. 44.

AMATEUR EXPERIMENTAL LICENCE.

K Licence No.
Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.
LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of

hereinafter called the licensee, is hereby licensed to establish and operate an amateur experimental radio station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar (\$1.00) being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context, repugnant to such construction, that is to say:—

The term "Ministar" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling" by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

4. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licences:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

5. (a) The licensee shall, if so required by the Minister, cease to use the licensed transmitting apparatus for such period or periods in each day as may be specified by the Minister.

(b) The licensed transmitting apparatus shall not be used during the periods when official time signals are being broadcasted.

6. The waves emitted must be as little damped as possible. In the case of spark stations the logarithmic decrement of a complete oscillation shall not exceed two-tenths and in the case of C.W. and radiotelephone stations the equivalent decrement shall not exceed that specified in the licence.

7. When the licensed station is in the vicinity of a Government or Commercial radio station it must be provided with a connection with the local wire telephone system.

8. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

9. The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelengths.

10. Broadcasting of any description by the licensed station is not allowed.

11. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

12. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

13. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to

time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

14. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy as provided for in Regulation No. 97 of the Minister's Regulations.

15. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such stations for the purpose of sending and receiving messages, by radio or all other telegraphic instruments and apparatus fixed and being in such stations, and the working and user of such apparatus and telegraphic instruments.

16. (i) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, or any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(ii) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

17. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

18. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

19. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Type of Aerial.....
5. Transmitting wavelength (1) Spark.....
(2) C.W. or Telephone.....
6. Decrement per complete oscillation.....
7. Characteristics of transmitter.....
8. Characteristics of receiver.....

9. Source of power.....
10. Maximum to be taken by transmitter....
11. If A.C., number of cycles.....
12. Hours during which the station must not transmit.....

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19..

W. 70.

AMATEUR BROADCASTING LICENCE.

L Licence No.
Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.
DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder. The herein named

resident of
hereinafter called the licensee, is hereby licensed to establish and operate a radio land station at
for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00), being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other radio station in Canada, or with Marine signalling on the waters or territory of Canada, or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) With respect to any alteration of programmes which the Minister may think necessary and

(c) Generally with respect to avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40 issued by the Department of Marine and Fisheries.

11. A proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

12. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

13. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

14. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

15. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

16. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

17. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case the Minister may, by writing revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

18. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise), in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

19. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

20. The licensee may, subject to the approval of the Minister, authorise the use of a station belonging to one of its members to broadcast on its behalf. Such station whilst broadcasting becomes the licensed station authorised hereunder and the licensee will be responsible for its proper operation in accordance with the provisions of this licence.

21. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents may be under the hand of any authorised officer for the time being, of the Department of the Marine and Fisheries, and may be served by sending the same by registered post letter to the..... office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station.....
 2. Location.....
 3. Call Signal.....
 4. Normal Range Day.....
Night.....
 5. System of Radio.....
 6. Type of Aerial.....
 7. Characteristics of Transmitter.....
 8. Characteristics of Receiver.....
 9. Decrement per complete oscillation.....
 10. Wavelengths (Normal underlined).....
 11. Source of power.....
 12. Rating of motor generator.....
 13. Maximum power to be taken by transmitter, and voltage.....
 14. Hours of service.....
 15. Operators to be borne on station:—
1st Class.....
2nd Class.....
3rd Class.....
- Deputy Minister of Marine and Fisheries.*
Department of Marine and Fisheries, Ottawa.
Dated this.....day of.....19..

W. 20.

EXPERIMENTAL LICENCE.

Licence No.

Call Signal.

M

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named

resident of hereinafter called the licensee, is hereby licensed to establish and operate an experimental radio station situated at for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars (\$5.00) being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radio, and for no other purpose whatever.

4. No tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other radio station.

(b) Generally with respect of avoiding interference between one radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. The licensed station must be provided with an accurate wavemeter of approved type.

9. The licensed station must be provided with a connection with the local wire telephone system.

10. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

11. The allotment of the wavelengths or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

12. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

13. When using a wavelength greater than 275 metres a proces verbal of all signals transmitted, giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all proces verbaux for such period as is from time to time prescribed by the Minister and such papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

14. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensed apparatus shall only be worked by a person or persons holding such certificates as are specified in the schedule annexed hereto

17. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments.

18. (1) In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

(2) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

19. Nothing in these presents contained shall prejudice or effect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radio communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working or user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of Marine and Fisheries, Ottawa.

1. Name of Station.....
2. Location.....
3. Call Signal.....
4. Normal range, Day.....
- Night.....

5. System of Radio.....
6. Type of Aerial.....
7. Characteristics of Transmitter.....
8. Characteristics of Receiver.....
9. Decrement per complete oscillation.....
10. Wavelengths (Normal underlined).....
11. Source of power.....
12. Rating of motor generator.....
13. Maximum power to be taken by transmitter and voltage.....
14. Hours during which station may transmit.....
15. The station must be worked by persons holding the following certificates:—
When transmitting on . . . metre wave..
When transmitting on . . . metre wave..
16. Stations with which the licensed station may communicate.....

Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries, Ottawa.

Dated this . . . day of . . . 19 . . .

W. 69.

PRIVATE COMMERCIAL BROADCASTING LICENCE.

N

Licence No.

Call Signal.

DEPARTMENT OF MARINE AND FISHERIES.

DOMINION OF CANADA.

LICENCE TO USE RADIO.

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statute 1913, and the Regulations made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a Radio land station situated at . . . for the term of one year commencing on the first day of April, and terminating on the thirty-first day of March, . . . and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of Fifty dollars (\$50), being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say:—

The term "Minister" means the Minister or the Deputy Minister of the Department of Marine and Fisheries for the time being, the term "radio" means and includes "radiotelegraph" and "radiotelephone," and the expression "marine signalling" means signalling by means of any system of radio between two or more ships, between ships and any coast station, or between two Government coast stations.

2. The licensee shall not establish, install or work any apparatus for radio, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to broadcasting.

4. The licensee shall not, without the consent of the Minister in writing, receive or collect any tolls, fees or other consideration on account of any service performed by the licensed station.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any other Radio station in Canada, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of syntony or enabling signals transmitted by means of the licensed apparatus to be distinguished from those emanating from any other Radio station.

(b) With respect to any alteration of programmes which the Minister may think necessary, and

(c) Generally with respect to avoiding interference between one Radio station and another.

6. The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period or periods in each day as may be specified by the Minister.

7. The equivalent logarithmic decrement of the emitted waves shall not exceed that prescribed in the schedule.

8. (a) The licensed station must be provided with an accurate wavemeter of approved type;

(b) The licensed station must be provided with a connection with the local wire telephone system.

9. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

10. (i) If and whenever any department of the Government shall require the licensee, his servants or agents to transmit by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other transmissions and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof suspend all other transmission.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of Marine and Fisheries.

12. A procès verbal of all signals transmitted giving date, time and nature of such signals shall be kept by the licensee, also such further particulars as the Minister shall from time to time reasonably require. The licensee shall preserve all procès verbaux for such period as is from time to time prescribed by the Minister, and such papers shall be open to the inspection of

the Minister or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

13. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radio and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of any International Radio Convention to which Canada subscribes, as are applicable to the operation of the station.

16. The licensee shall install the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this licence, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

17. All operators at the said station shall be British subjects, and must be of such number and the holders of such Certificate of Proficiency as are specified in the schedule annexed hereto.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licence to be observed and performed then in any such case the Minister may, by writing revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become a void.

19. (a) Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radio communication (whether, of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister from time to time, to enter into agreements of or to grant licences relative to the working and user of radio (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radio, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

(b) The allotment of the wavelength or wavelengths specified in the schedule annexed hereto does not confer a monopoly of the use of such wavelength.

20. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

21. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of Marine and Fisheries and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Department of Marine and Fisheries, Ottawa.

SCHEDULE.

1. Name of Station
2. Location
3. Call Signal
4. Normal Range, Day
- Night.....

5. System of Radio
6. Type of Aerial
7. Characteristics of Transmitter
8. Characteristics of Receiver
9. Decrement per complete oscillation.....
10. Wavelengths (normal underlined).....
11. Source of power.....
12. Rating of motor generator
13. Maximum power to be taken by transmitter, and voltage
14. Hours of Service
15. Operators to be borne on station :—
 1st Class.....
 2nd Class.....
 3rd Class.....

Deputy Minister of Marine and Fisheries,
 Department of Marine and Fisheries, Ottawa.
 Dated this.....day of.....19..

CEYLON.

(See Maps 17 and 18)

Including : Maldie Islands.

THE Island is administered by a Governor aided by an Executive Council.

CONTROL.

The wireless station is under the control of the Postmaster-General and Director of Telegraphs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. E. Harper, M.I.E.E.,... Mem. Inst. Radio Engrs.	Chief Engineer	Colombo.
Mr. A. G. Tillekeratne ..	Superintendent of Traffic	Colombo.
Mr. M. J. Golightly ..	Officer in Charge of the Wireless Station ..	Colombo.

There are no experimental, amateur or ships' stations licensed in Ceylon.

An amending Ordinance is at present before the Legislative Council and rules governing the issue of experimental licences will be published as soon as this Ordinance has become law.

An amateur organisation, "The Ceylon Radio Society" has been recently formed for the development of local study.

ADMINISTRATION.

Wireless telegraphy in Ceylon is regulated (a) by such clauses of the 1908 Ordinance as are applicable to wireless telegraphy ; (b) by the amending Ordinance (No. 15) of 1914 ; and (c) by the rules formulated under the provision of the latter Ordinance.

A—Ordinance No. 15 of 1914 (August 18th).

B—Rules under this Ordinance.

C—Proposed Ordinance for further amendments to the Ceylon Telegraph Ordinance, 1908.

ORDINANCE.

A Ordinance No. 15 of 1914 (modifying Ordinance No. 35 of 1908) and dated August 3rd, 1914, provides in its Clause 5 an amendment of Section 7 of the 1908 Ordinance. This prescribes the right of the Governor in Executive Council to "make rules, consistent with the Ordinance, for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this

Ordinance." Rules under this section may provide for all or any of the following, amongst other matters, that is to say :—

(a) The rates at which, and the other conditions and restrictions subject to which messages shall be transmitted.

(b) The precautions to be taken for preventing the improper interception or disclosure of messages.

(c) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the

custody of, telegraph officers shall be preserved; and

(d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer.

(e) For prescribing the form and the manner in which applications for licences under this Ordinance are to be made.

(f) For prescribing fees payable on the grant of any licence.

(g) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, shall be worked so as to prevent interference with naval signalling, or the working of any wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea.

(h) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon.

(i) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may deem fit to make from time to time, either in all cases, or in such cases as may be deemed desirable.

Moreover, Clause 6 of Ordinance No. 15 of 1914 adds to Clause 7 of the 1908 Ordinance a new sub-section lettered (2) A, which runs as follows:—

Provided that no regulations made in respect of the matters described in paragraphs (g), (h), and (i) or sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

RULES.

B The current rules, under which the wireless telegraphy is at present administered, were issued on December 3rd, 1914. They were based on Ordinance 15 of 1914 (see above) and run as follows:—

DECEMBER 3RD, 1914.

1. Any person desirous of obtaining a licence for the establishment of a wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony, or on board any British ship registered in the Colony, must apply in writing to the Colonial Secretary. Such application must contain full particulars—

(a) Of the place or ship in respect of which a licence is sought;

(b) Of the nature of the apparatus which it is desired and proposed to install and work; and

(c) Of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licences:

	Rs.
(a) For a licence for a land station	5
(b) For a licence for a ship station	5
(c) For an experimental licence	Free

3. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony, shall be worked in such a way as not to interfere with:

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or in the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station, whether on shore or on any ship.

5. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port, or bay of the Colony, except with the special or general permission of the Postmaster-General.

6. (i) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board merchant ships, whether British or foreign, whilst in the waters of the Colony, shall be subject to such rules as may be made by the Governor, and such rules may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

(ii) Such notice as aforesaid shall be published in the *Ceylon Government Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress,

The following Draft was published in the *Ceylon Government Gazette*, June 22nd, 1923.

AN ORDINANCE FURTHER TO AMEND "THE CEYLON TELEGRAPH ORDINANCE, 1908."

C Whereas it is expedient further to amend "The Ceylon Telegraph Ordinance, 1908": Be it therefore enacted by the Governor of Ceylon, by and with the advice and consent of the Legislative Council thereof, as follows:

This Ordinance may be cited as "The Ceylon Telegraph (Amendment) Ordinance No. of 1923."

2. Section 4 of the principal Ordinance as the same is set forth in section 4 of Ordinance No. 15 of 1914 is hereby repealed, and there shall be substituted therefor the following section:

4. (1) No person shall install, establish, maintain, or work any telegraph in any place or on board any aircraft in Ceylon, or on board any British ship registered in Ceylon, or import or sell any apparatus for wireless telegraphy, except under and in accordance with a licence granted in that behalf by the Governor as hereinafter provided. Provided that nothing in this section shall preclude any person from establishing telephonic communication by wire between separate portions of any ship or aircraft or of any building, or between any two or more buildings within the limits of any property belonging to the same owner.

(2) The Governor, whenever he shall deem it expedient to do so, may grant to any person a licence to install, establish, maintain, or work any telegraph in any place or on board any aircraft in Ceylon or on board any British ship registered in Ceylon, or to import or sell any apparatus for wireless telegraphy.

(3) Every such licence shall be in such form, and for such period, and in consideration of such payments as the Governor, with the advice of the Executive Council, may determine, and shall contain such terms, conditions, and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

3. Section 7 of the principal Ordinance, as the same is amended by sections 5 and 6, Ordinance No. 15 of 1914, is hereby repealed, and there shall be substituted therefor the following section:

7. (1) The Governor in Executive Council may from time to time by notification in the *Government Gazette*, make rules consistent with this Ordinance for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this Ordinance.

(2) Rules under this section may provide for all or any of the following among other matters, that is to say:

- (a) The rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted;
- (b) The precautions to be taken for preventing the improper interception or disclosure of messages;
- (c) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved;
- (d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer;

(e) For prescribing the duration of licences and the form and the manner in which applications for licences under this Ordinance are to be made;

(f) For prescribing fees payable on the grant or renewal of any licence;

(g) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, or aircraft while in or over the Island of Ceylon or the territorial waters thereof, shall be worked so as to prevent interference with naval signalling, or the working of any wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea, or on aircraft;

(h) For prescribing terms and conditions subject to which licences may be granted for the installation or establishment of any telegraphs;

(i) For regulating and controlling such telegraphs and the use thereof;

(j) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon, or, in the case of aircraft, when such craft is not in flight; and

(k) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, or on aircraft while over the territory or territorial waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters, or aircraft while over such territory or territorial waters, by such further rules as the Governor may deem fit to make from time to time either in all cases, or in such cases as may be deemed desirable.

(3) Provided that no regulations made in respect of the matters described in paragraphs (g), (j), and (k) of sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

(4) When making rules for the conduct of any telegraph established, maintained, or worked by any person licensed under this Ordinance, the Governor in Executive Council may, by the rules, prescribe fines for any breach of the same. Provided that the fines so prescribed shall not exceed the following limits, namely:

- (i) When the person licensed under this Ordinance is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees for every day after the first during the whole or any part of which the breach continues.

(ii) When a servant of the person so licensed, or any other person, is punishable for the breach, one-fourth of the amounts specified in clause (i).

(5) And in default of payment of any fines mentioned in sub-section (4) (i) and (ii), the court may impose imprisonment of either description for a term not exceeding six months.

4. Section 20 of the principal Ordinance, as the same is set forth in section 7 of Ordinance No. 15 of 1914, shall be amended by the insertion of the words "or imports or sells or attempts to import or sell any apparatus for wireless telegraphy" immediately after the word "telegraph" in line 2 of sub-section (1) thereof.

5. Section 41A of the principal Ordinance, as the same is contained in section 8 of Ordinance

No. 15 of 1914, shall be amended in the following respects:

(a) By the insertion of the words "or any apparatus for wireless telegraphy has been imported or sold" immediately after the word "worked" in line 4 thereof;

(b) By the insertion of the words "or aircraft" immediately after the word "ship" in line 6 thereof;

(c) By the substitution of the words "ship or aircraft" for the words "or ship" in line 8 thereof; and

(d) By the insertion of the words "or to have been imported or sold" immediately after the word "telegraphy" in line 9 thereof.

By His Excellency's command,
Colonial Secretary's Office, CECIL CLEMENTI,
Colombo, May 14th, 1923. Colonial Secretary.

CHILE.

(See Maps 49, 52 and 53)

CONTROL.

WIRELESS Telegraphy in Chile is a State monopoly under the management of the Naval Department.

All Chilean wireless stations, both ship and land, are controlled by the Admiralty, and the Wireless Section of the Navy forms part of the general organisation administering naval affairs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Vice-Admiral Don Miguel Aguirre	Chief of the General Maritime Office	Dirección del Territorio Marítimo Valparaíso
Lieut.-Com. Don. V. Merino B.	Head of the Wireless Section ..	Do. Do.

ORGANISATION.

At the present time the number of stations in operation total 78; these include 18 land stations varying in power from $\frac{1}{10}$ kW. to 100 kW. The stations fall under the following classification:—

Ship Stations	— Naval	31
" "	— Mercantile	33
Land Stations	— Open to public service ..	12
" "	— Control	1
" "	— Experimental	3
" "	— For aviation services ..	1
" "	— Amateur	30
Air	— Aero-hydroplane	3
Broadcasting	— "	1

ADMINISTRATION.

Below will be found the Regulations governing the use of wireless in Chile.

A—Law governing wireless service in Chile.

B—Regulations for the Wireless Service.

(Licences and Categories, Wireless Sets, Staff, Service and Documentation, Inspections, Belligerency and Neutrality of the Wireless Stations, Licence for Ship Wireless Station, Wavelength, Licence for Ship Wireless Operator.)

C—Regulations for Radio Communication.

(General Dispositions, Acceptance, Taxation and Payment of Radiotelegrams, Transmission and Reception of Radiotelegrams, School for Mercantile Radiotelegraph Operators, Admission of Students, Examination of Students, Examination for Second and First-class Operators, Repetition Courses and Requalifying for Titles, Syllabus of Oral and Written Examinations.)

D—Regulations for Private, Amateur, and Practical Radiotelegraph Stations.

PROJECT OF LAW GOVERNING THE
WIRELESS SERVICE IN THE
CHILEAN REPUBLIC.
SECTION I.

A ART. 1.—Wireless stations destined to transmit and receive wireless signals to or from other wireless stations in Chile or in any other foreign country, can only be installed and worked by the State.

Nevertheless, the State may permit the installation and working of private wireless stations destined exclusively to experimental work or for purposes of instruction, but under the condition that the power of such stations shall not exceed 1/12 h.p. All wireless stations installed for experimental or educational purposes shall be submitted to the inspection and control established in the respective regulation.

ART. 2.—All persons that install or attempt to install clandestine wireless stations of any kind shall be liable to punishment according to the regulations of the service and the laws of the country.

The State will confiscate all the material employed in these clandestine stations.

ART. 3.—(a) The State will dispose the installation of all the wireless stations in the country electing the sites according to plans consulting all military, naval and commercial necessities of the country.

(b) In those isolated regions of the country where private persons solicit wireless communication and there exists manifest convenience in the establishment of such communications, wireless stations may be installed, but under the condition that the land required shall be ceded to the State by those interested also the total cost or that part of the cost decided upon by the Government, shall be borne by the persons or parties interested in the said communication.

At the termination of the construction of such stations the same shall pass over wholly to the State together with the land occupied.

ART. 4.—The wireless installations shall be as uniform as possible, and of a national type that shall satisfy the wireless service of the country and the different parts shall, as far as possible, be made in the country.

ART. 5.—All the wireless stations destined to transmit or receive wireless communications of any kind shall be under the charge of the Ministry of Marine, and the stations shall be worked by personnel of the Navy with exception of the Army wireless stations which will be under the charge of the Ministry of War.

ART. 6.—The Minister of Marine will designate the wireless stations that may attend public service of wireless communication.

These stations shall be directly connected to the State land telegraphs, which will serve to connect the wireless stations with the general public.

The tariffs shall be collected under the charge of the Minister for Home Affairs, and the said Ministry shall maintain all relations and communications that the wireless service may cause with other foreign administrations, wireless telegraph companies, telegraph or cable companies.

ART. 7.—(a) Six months after this law is passed no ship will be allowed to enter or leave any of the ports of the Chilean Republic that carries 50 or more persons on board (including the crew), unless the ship is installed with wireless telegraph apparatus.

The wireless apparatus must be in working order and be capable of transmitting and receiving messages at a distance not less than 200 miles during the daytime.

(b) In certain accidental cases expressly

determined by the respective regulations, ships may be allowed to enter or leave Chilean ports, although they may be carrying 50 or more persons on board, and are not installed with wireless telegraph apparatus.

(c) The respective regulation will fix the number of operators, capable of working the wireless installation that all merchant ships must carry according to their class, which class will be determined by the same regulation.

(d) Any infraction or attempt at infraction of this article will be fined the sum of from one to five thousand Chilean gold dollars.

ART. 8.—(a) The wireless apparatus installed on board Chilean merchant ships will be subjected to the conditions that the respective regulations may fix.

(b) All wireless operators on board Chilean merchant ships must be of Chilean nationality.

(c) The Government will establish annexed to the Naval wireless school, the necessary courses of instruction to form operators destined to serve in the National Merchant Marine.

The cost of these courses will be paid for by the companies or persons concerned, in the form to be indicated by the respective regulation.

ART. 9.—In the annual budget funds will be consulted to maintain and increase the State Wireless Telegraph Service.

SECTION II.
GENERAL REGULATIONS OF THE
WIRELESS SERVICE.

CHAPTER I.

LICENCES AND CATEGORIES.

B ART. 1.—Every sailing or mechanically propelled vessel having 50 persons or more on board, including the crew, and not being permanently anchored, must possess an efficient wireless set capable of communicating up to 200 miles during the day.

ART. 2.—(a) Before carrying out any installation whatever, the company or shipowners should apply in writing to the Maritime Territory Section of the Navy, for a numbered copy of the special formulary of licences, in order to fill in the particulars of the wireless set, and return it duly completed to the said authorities.

(b) Subject to the corresponding report by the wireless inspector, this document shall be submitted through the usual channel to the supreme Government for its approval.

(c) Only from the time the licence is approved by the Government will the shipowners be allowed to use the wireless set.

(d) The licences to be made out for a period not exceeding five years.

ART. 3.—It is prohibited to use a wireless set without a licence, or with one when same has expired, unless the companies, shipowners or proprietors, have made an application for its renewal, and this is granted in accordance with Art. 2.

ART. 4.—Such shipowners, companies or proprietors of wireless sets, who should be in need of a duplicate of the licence in order to replace the original one lost or destroyed, must lay before the Maritime Territory Section evidence of the circumstances which caused such loss or destruction. That duplicate will be given by this authority, with the same original number and with the word "duplicate" written in red letters, and diagonally across the first page.

ART. 5.—The following vessels are excepted from the obligation set up in Art. 1:—

(a) Those national ships registered with less than 100 tons, which do a coasting trade exclusively within inhabited canals or sheltered and safe bays.

(b) Those national ships of small cargo which carry ordinarily less than 50 persons on board, are incidentally used for pleasure excursions or others of a sporting character, and consequently carry a greater number of persons. These excursions should not be in excess of four in 30 consecutive days, nor be made outside a radius of 30 nautical miles from the starting point, nor last longer than 24 hours each time.

ART. 6.—Such vessels as are included in Clauses (a) and (b) of the previous article, shall apply in writing to the Maritime Territory Section of the Navy for the corresponding licence, enclosing a maritime authority certificate of the registered port, attesting the right of exception.

The Maritime Territory Section shall make out the licence for periods to be renewed on the 1st January of each year, on the application of the person concerned.

ART. 7.—The wireless station to be classified in three categories namely:—

(a) First category.—To this category belongs those ships that have a permanent service, and that carry more than 50 persons on board and that develop an average speed of 12 miles an hour, and under these conditions run a single trip not exceeding 500 miles.

(b) Second category.—To this category belongs those ships that have a service of limited duration, and that carrying more than 50 persons on board, develop an average speed of less than 12 miles, and under these conditions do not run more than 500 miles per single trip.

(c) Third category.—To this category belongs those ships that have no regular service, and that are not included in the first and second categories.

(d) The categories will be assigned in the licences for installing wireless sets.

CHAPTER II.

CONCERNING THE WIRELESS SETS.

ART. 8.—The type or system of the wireless set is left to the option of the company, ship-owners or proprietors, an express condition being that the circuits composing it should be "syntonised," i.e., have the same period of vibration.

ART. 9.—(a) The power of the wireless set will be sufficient to obtain a distance of 200 nautical miles during the day, and is at all times to be in a state for use.

(b) While wireless communications are being made the minimum power consistent with the distance will be employed.

(c) The companies, shipowners or proprietors will, however, be able to dispose of a higher power than the one set up in Clause (a) of this article, subject to an application being made for it when filling in the particulars of the licence.

(d) The wireless set will be tried at full power once a week to verify its efficiency.

ART. 10.—(a) The normal wavelength is 600 metres and every station must be able to use this wavelength as well as that of 300 metres.

(b) Wireless communications between vessels and with land wireless stations will always be made with 600 metres wavelength; but such characteristic may be, by mutual agreement, altered in cases of difficulty in the transmission, the normal wavelength to be resumed at the end of the transmission of the message.

(c) The waves emitted shall be very pure and as deadened as possible.

ART. 11.—It is prohibited to use the simple vertical radiator, except in cases of signals for help; the aerial of this type, implying that which

allows for the direct transmission of waves by means of sparks.

ART. 12.—The wireless set must be capable of transmitting and receiving messages at a speed of no less than 20 words per minute, calculated at the rate of five words per minute.

ART. 13.—(a) Every wireless station shall be provided with a quantity of spare-parts and tools necessary for repairs and to rapidly replace those elements which may deteriorate by accidents.

(b) A pair of complete telephone receivers to be always kept in reserve.

(c) Similarly, a voltmeter, a hydrometer, electrolite, and distilled water, for the working and preservation of the battery will also be available.

ART. 14.—(a) Between the wireless station and the bridge will be established an efficient communication, for which object a telephone, or speaking-tube, may answer the purpose. Such communication will commence and end at either of the above-mentioned points, or in the chart room, if this is near the bridge.

(b) Should the wireless station be accessible from the bridge the orders may be given by word of mouth, without having a special communication installed.

(c) Verbal transmission of messages by means of a third person is prohibited.

ART. 15.—Any alteration in the apparatus involving a change in the characteristics of the wireless set is subject to the authorisation of the Maritime Territory Direction.

ART. 16.—(a) Where the ship to which the wireless set belongs goes under repairs for more than three months, the licence will be forwarded to the Maritime Territory Direction with a view to writing on it the corresponding annotations.

(b) In case of definitive dismantlement of the ship, or of it being placed on a different service not requiring it to possess a wireless set, the licence will likewise be sent for its cancellation to the Maritime Territory Direction.

ART. 17.—(a) Every ship will have an emergency power independent of the principal electric plant, capable of transmitting wireless messages for four consecutive hours at least, and sufficiently protected against accidents.

(b) The transmitting apparatus will be continuously in a state of working by means of the emergency power at only two minutes' notice.

(c) Before sailing, and daily while at sea, the wireless set will be tried utilising the emergency power, and its results will be noted in the wireless log.

(d) Occasionally, from the land stations, the ships at sea will be called upon to send messages with the emergency power, in order to ascertain their efficient condition.

CHAPTER III.

STAFF, SERVICE AND DOCUMENTATION.

ART. 18.—(a) For the working of wireless sets on board the Chilean mercantile ships, the operator is required to be in possession of the title of wireless telegraphist, conferred by the Maritime Territory Direction of the Navy.

(b) Only Chilean subjects, or naturalised foreigners, in accordance with the Republican Laws, will be able to obtain those titles.

(c) Candidates for the position as wireless operators must pass the examinations set up in Section IV of the present General Rules, and comply with the requirements therein laid down.

(d) Every wireless operator is bound by oath to maintain strict secrecy in the correspondence whatever the nature of this may be.

ART. 19.—The titles are of two classes: First and Second:—

(a) First Class.—Titles of this class will

be conferred upon those operators who, having passed satisfactorily the examinations in Section IV, can send and receive wireless messages at a speed of not less than 20 words a minute (Chapter II, Art. 12).

(b) Second Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations quoted in the previous clause, can send and receive wireless messages at a speed of between 12 and 19 words a minute.

ART. 20.—The appointment of wireless operators in the mercantile vessels will be as expressed below:—

(a) First category wireless station.—This will have at least two first class wireless operators.

(b) Second category wireless station.—This will have at least one first class operator and one second class.

(c) Third category wireless station.—This will have at least one first class operator and one second class.

ART. 21.—The service of watchmen will be run in accordance with the category to which the wireless stations belong (Art. 7, Chapter I), as follows:—

(1) First category wireless stations.

(a) The watch will be kept permanently, that is to say, the wireless operator will continuously have the receivers on, or off, but within the premises of the wireless station, when this be fitted with special instruments of communication, such as bells, etc.

(b) The wireless operator will communicate every half-an-hour to the official on duty on the bridge any changes, to show that he has not abandoned his post.

(c) He will make notes on the station log every quarter-of-an-hour, making sure that such notes consist of characteristics of other stations and of other words intercepted.

(2) Second category wireless stations.—The watch will consist of at least 10 hours daily and of 10 minutes at the beginning of each remaining hour; the same obligations as those laid down in the previous clause applying to the operators of these stations while they are on duty.

(3) Third category wireless stations.—The watch will be eventuated, as when entering or leaving the port, in places of much maritime traffic, etc., leaving the organisation of the service to the arbitration of the ship's captain.

ART. 22.—(a) Should an operator fail to comply with the present regulations, the information to that effect being given either by the ship's captain or through the controlling wireless stations, the Maritime Territory Direction of the Navy will have the option or suspending the culprit for a given time, of definitely cancelling his title, according to the gravity of the omission.

(b) Where such omissions are not the fault of the operator himself, but through reasons over which he has no control, or through express orders of the companies, shipowners or proprietors, the Maritime Territory Direction of the Navy, will make the necessary inquiries and the consequent fine will be made against him.

ART. 23.—The wireless service on board a merchant ship is subject to the supreme authority of its captain, who will see that the wireless station is in good order of preservation, efficiency and cleanliness, and that the conditions of the present rules are strictly complied with.

ART. 24.—When ships are in port, the wireless

station will be kept closed, the key to remain, in every case, on board in case the Maritime Authority should desire to make an inspection.

ART. 25.—Every station shall have the following documents:—

- (1) The wireless station licence.
- (2) A copy of the present Rules.
- (3) A copy of the "Berne Official List of Wireless Stations," together with its latest supplements.
- (4) Range formularies, in the number required.
- (5) Pages of range formularies.
- (6) A copy of standing tariffs.
- (7) A blackboard placed outside the wireless station wherein will be noted consecutively the wireless stations coming into the range of distance.
- (8) A log of the wireless station.

CHAPTER IV.

INSPECTIONS.

ART. 26.—In pursuance of Art. 44 of the Navigation Law, the stations of all coast mercantile ships, both national and foreign, will be inspected every six months. To this effect the Maritime Authority will delegate its functions on those inspectors mentioned in the subsequent article, who will form part of the Inspection Committee.

ART. 27.—The Maritime littoral will be composed of a general inspection, stationed in Valparaiso, and four district inspections as follows:—

(a) Punta Arenas, covering the whole zone of the Estrecho and canals of Patagonia and Tierra del Fuego.

(b) Port Montt, covering all Chiloe and Moraleda canals, as far as the Penas Gulf, including Ancud Bay.

(c) Talcahuano, covering from Ancud as far as Talcahuano.

(d) Antofagasta, covering from Caldera up to the north.

In charge of the General Inspection will be the "Inspector of Wireless Telegraphy of the National Mercantile Marine." Such inspector will have under his jurisdiction the whole littoral of the Republic.

The district inspectors will be officials in the Navy, competent in wireless telegraphy, either in service or retired. These inspectors will be under their respective Maritime Authority, and are only inspecting the ships of their list, not out of the zones allotted to them.

In Valparaiso the wireless telegraphy inspector will inspect all the other ships.

ART. 28.—The district inspectors will, in all that concerns the obligations under their charge, be under the wireless telegraphy inspector, to whom they must send a report monthly of the ships inspected, giving particulars worth mentioning and suggestions as to the steps which should be taken.

ART. 29.—The Maritime Authorities will be able, when any infraction of the regulations or failure in the installation comes to their knowledge, to decree a special inspection, either by the corresponding inspectors, or in those ports without one, by an official on active service or retired, competent in wireless telegraphy, appointed for the purpose.

ART. 30.—In the half-yearly inspection mentioned in Art. 26, the inspector must pay special attention to the instruments of the station being in good condition, and to the efficiency being what is required of them, and also—

(a) To receive those complaints on the service of communications made by the company, captains, or passengers.

(b) To verify that the wireless set be syntonsised to the waves of 300 and 600 metres.

(c) To ask for the presentation of the following documents:—

Licence of the wireless station; to verify that the telegraphists are the number required, and that they are in possession of their titles; to go through the communications records, and investigate any complaints received regarding infractions of the International Regulations, or others. All of which must be recorded in the Navigation Certificate, without which requisite this will be valueless.

ART. 30A.—With regard to foreign ships, not included in Art. 26, the Maritime Authority of the first port at which the ship calls, will, in accordance with the International Convention dispose that the person indicated in Art. 29, shall effect an inspection, making sure that the ship carries the licence from its respective Government in which the working of the wireless station is authorised, and that the operators possess the necessary titles.

Should not these documents be shown to them, the inspectors will be able to verify as to whether the installations comply with the conditions stipulated in the said Convention, and if the personnel is competent.

If such a visit could not be effected, through the want of an inspector, the Maritime Authorities of the other ports at which the ship calls will be advised of it.

ART. 30B.—Excluding the inspections indicated in Art. 26, the companies, shipowners, captains or proprietors, who require it, may apply in writing to the Maritime Authorities, for the inspection of the wireless stations on their ships, or for new installations being effected in them.

The corresponding authority will comply with the request in accordance with the circumstances, and will at once communicate with the Maritime Territory Direction.

ART. 30C.—The tariff for the wireless telegraphy and telephony inspectors will be exclusively borne by the vessel, and are as follows:—

Class of Work.	Wireless telegraphic and telephonic station up to 2 kW. power.	Wireless telegraphic and telephonic station above 2 kW. power.
(A) Half-yearly inspection	Dols. 20'00	Dols. 30'00
(a) Study of plans and specifications of wireless stations to be installed.	150'00	200'00
(b) Inspection of a wireless station installation ..	250'00	350'00
(c) Installation of a wireless station	1000'00	2000'00
(d) Study of plans and specifications for repairs or alterations in a wireless station.	100'00	150'00
(e) Inspection of repairs or alterations in a wireless station.	200'00	300'00
(f) General inspection of a station in service, either compulsory or by application.	75'00	100'00
(g) Partial inspection of a station in service, either compulsory or by application.	50'00	75'00

Kind of Infraction	Amount of the penalty or fine.
(a) Vessels not having any wireless set installed, as stipulated in the Regulations.	Sailing cancelled and fine of from \$1,000 to \$5,000 gold of 18 ct.
(b) Vessels with wireless sets installed on them, but without the necessary licence, through not having applied for it, and for not having renewed that which has expired, or for not having asked for a duplicate of the one destroyed, thus testifying its destruction.	Sailing cancelled, fined with \$500, the requisites to be complied with on payment of the fine.
(c) That vessel which is excepted from having a wireless set installed, but has not applied for its corresponding licence of exception.	\$150, the document to be applied for on payment of the fine.
(d) That vessel which being equipped with a wireless set lacks the necessary spare parts and tools (Art. 13).	\$50 each time the infraction is discovered.
(e) That vessel which being equipped with a wireless set, has no efficient communication between the bridge and the station.	\$25 each time the infraction is discovered.
(f) Any vessel making alterations in its wireless set without previously applying for an authorisation from the Maritime Authority.	\$150 each time the infraction is discovered.
(g) Any vessel which, being equipped with a wireless set, does not possess emergency power (Art. 17).	\$200, to proceed with such installation immediately upon payment of the fine.
(h) Any vessel which, being equipped with a wireless set, does not have the statutory number of operators, and these fail to comply with the provisions of Chapter III.	Cancellation of sailing for first offence, and \$25 for each operator's infraction.
(i) Misemployment of the signal for help	\$5,000.
(j) False communications, talking, discussions, superfluous signals or interruptions (Art. 15, Clause (a), Section III).	\$100.
(k) Any ship which, being anchored in port, uses its installation for directly communicating with other ships.	\$500.
(l) Every infraction of the regulations not made by the operator himself but by other causes over which he has no control, or by express orders of the company, shipowners or proprietors (Art. 22, Clause (b), Section II).	\$300 up to \$1,000.

The power of the stations to be taken at the terminals of the generator.

ART. 31.—Infractions of the regulations incurred by shipowners, companies or operators will be punished with fines for the benefit of the Naval Hospital, as under :—

CHAPTER V.

BELLIGERENCY AND NEUTRALITY OF THE WIRELESS STATIONS.

ART. 32.—When the Republic of Chile is in a state of war, all wireless stations belonging to its mercantile ships will be requisitioned by the National Navy.

ART. 33.—When the Republic of Chile declares itself neutral in armed conflicts among other nations, those national and foreign vessels which patronise her shores will be subject to complying with the articles as laid down below.

ART. 34.—(a) No national wireless station will be allowed to maintain any relationship with either the foreign representatives or those of the Republic, nor demand or supply any information at all, other than through the medium of the Foreign Office.

(b) In some exceptional cases such relations may be directly cultivated, but to do so both the express consent of the Foreign Office and the assent of the Ministry of the Navy and General Army Direction will be required.

(c) All wireless telegraphy or telephony communication regarding the position of the states, or any message capable of disclosing merchant and war ships of the belligerent same, or mentioning their names, is strictly prohibited.

(d) Likewise is strictly prohibited the misuse of signals for help for the purpose of favouring a certain belligerent.

(e) Shipowners and merchant vessel commanders shall give all kinds of facilities to the inspectors and other persons appointed by the State, whether in war-time neutrality or belligerency, in order to control the telegraphic stations as dictated to them by the Government.

(f) The Government will be able, through the Ministry for the Navy, to give orders in such cases as in war time, neutrality or belligerency for the transmission of telegrams in ordinary language.

ART. 35.—Where belligerent states develop their hostilities in waters near the national shores, the following disposition shall be strictly adhered to :—

(a) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, no matter of what nationality, navigating either within the Chilean littoral or lying anchored in Chilean ports, shall not in any way be able to use this apparatus.

(b) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, without regard to nationality, calling at any port or cover of the Republic, shall disconnect the aerial on casting anchor. Doors, windows, portholes and other means of access to the station will be sealed by the Maritime Authority. These seals can be broken as soon as the vessel leaves the Chilean littoral.

(c) Any vessel, both national and foreign, staying at a Chilean port for longer than three days shall have the aerial dismantled in the presence of the Maritime Authority, and be kept in the station under seal.

(d) Every operator on a national merchant ship who should become aware of any communications being sent contrary to these regulations, is bound to inform the local Maritime Authorities at once, so that they may take the necessary steps.

(e) Any merchant vessels that, owing to

long stay at a Chilean port, should require going through and cleaning its apparatus, can do so upon obtaining a permit from the local maritime authority. The operation to be effected during working hours and in the presence of the said authority, who at the end of the work will again place the seals thereon.

ART. 36.—Where the belligerent persons develop their hostilities in waters distant from the national littoral, the following dispositions will strictly be adhered to :—

(a) Vessels with fixed sailings, following a route within the country, will be allowed to keep their aerials connected while lying in Chilean ports, provided that their stay is not longer than three days.

(b) The premises occupied by the station will be sealed only when so directed by the superior Maritime Authority.

(c) Those ships having no fixed sailings, or an established route in the country, whatever their nationality, shall, during their stay in Chilean ports, keep their aerials disconnected from the time they cast anchor.

APPENDIX No. I.

LICENCE FOR SHIP WIRELESS STATIONS.

1. In conformity with the General Regulations of the Radiotelegraphic Service, of the merchant ships approved by Supreme Decree No..... of..... of..... Mr..... representative of the Company..... is authorised for a period of..... and subject to the undermentioned conditions to install and use a wireless set on ss. of the Chilean Mercantile Navy, for the transmission and receipt of service messages, official and private, at a tariff not exceeding that fixed by the International Convention.

2. The employment of the apparatus authorised by this licence is subject to that which is established by the International Convention of Radiotelegraphy, ratified by the Supreme Government, and also to all the regulations dictated from time to time by the authorities, by Government decrees or by new treaties.

3. The firm or company in possession of this licence should give all information demanded by the authority in the line of business concerned, in regard to entries and leaveings (in accordance with the Radio International Convention), to messages exchanged between the ship and other stations, and will pay to the said authority, when and how it is so indicated, all sums appearing in the respective accounts.

4. During the working of the station, its apparatus will be in charge or under the supervision of a person possessing the corresponding title granted by the Maritime Territory Direction of the Navy.

5. The station will give absolute priority to signals of help or danger, and on receiving or making such signals all other transmission will be stopped and will not be renewed until the communications concerning the ship in danger have been concluded.

6. The station will be ready to transmit danger signals with a normal wavelength assigned by the Radiotelegraphic International Convention, and with sufficient power in order that these signals can be received a distance of 100 nautical miles.

7. The station will use the minimum of energy necessary to effect communications, except in the case of messages concerning ships in danger.

8. The station will exchange communications with any other ship, without distinction of the system of radiotelegraphic installation used.

9. The station should not be used when the ships are in harbour, except in case of danger.

10. The President of the Republic can authorise in war time, strikes, mutinies, etc., to close or dismantle the station, and also to requisition the installation for the use of the authorities, granting an equitative bonus to the shipowners.

11. The Government inspectors or authorities will be able to inspect the wireless station when it is deemed necessary by the Maritime Territory Direction, or the Radiotelegraphic Inspection.

12. The installation should not be modified in any of the details specified in the form below.

FORM OF THE STATION AND ITS APPARATUS.

Ship.....
Number.....
Shipowners.....
Registered Port.....
International Characteristics.....
Radiotelegraphic Characteristics.....
Class of Service..... Hour.....
Power, primary transformer..... kw.
Power of the generating dynamos.....
Normal day range with other ships at sea, in nautical miles.....
Tariff on board per word.....
Minimum per radio.....
System employed.....
Characteristics of the transmitter used.....
Type of oscillator.....
Approximate frequency of spark.....
Characteristics of the receiver.....
Type of receiver.....
Scales of waves of the receiver.....
from..... metres..... up to..... metres.....
Aerial, number of masts.....
Height..... Type of aerial.....
Wire..... Number.....
Diameter and class.....
Dimensions required.....
Emergency apparatus..... Type.....
Power of the battery.....
Day range at sea.....
This licence will expire on the.....
of.....

Radiotelegraphic Inspector.

Director of the Maritime Territory.

Minister of War and the Navy.

APPENDIX No. 2.

REPUBLIC OF CHILE.

TERRITORY MARITIME DIRECTION OF THE NAVY.

TITLE.

For wireless operator of.....
Class.....
Inasmuch as.....
has passed the examination satisfactorily in the following subjects :—

(a) Handling, fitting and care of radio-telegraphic apparatus and batteries of accumulators.

(b) Transmission /and receipt by ear at a speed of..... words per minute.

(c) Knowledge of the radiotelegraphic service international regulations.

He is granted the title of wireless telegraph operator, Class valid for five years.

Valparaiso..... de.....

Note taken on.....

Radiotelegraph Inspector General.....

..... Maritime Territory Director

SECTION III.

RADIO COMMUNICATIONS.

CHAPTER I.

GENERAL DISPOSITIONS.

C ART. 1.—For the purposes of public correspondence between two ships and between these and the land stations, only the 300 or 600 metre wave shall be used; this limitation may, however, be increased by the Supreme Government when circumstances warrant it.

WAVELENGTH.

The normal wavelength for the transmission and receipt will be of 600 metres, the station will be for the use of two valves, one of 600 and the other of 300, such as it is stipulated in the International Radiotelegraphic Convention, and the position of the syntoniser for such waves should be clearly marked.

Where the transmitter radiates two or more waves as indicated by a sensitive wavemeter, the energy of the smaller one shall not exceed 10 per cent. of the energy of the larger one; the logarithmic decrement per complete oscillation not to be over 0.2, except when signals for help are transmitted; in such cases the transmitter can be syntonised in order to produce a maximum of interference with a maximum of radiation.

ART. 2.—Ship and land stations, open to public service, are under the obligation of communicating with one another when one of them so desires.

ART. 3.—Both Chilean and Mercantile foreign vessels navigating along the coast of the Republic should give preference to official messages of the Chilean national Navy.

Private or public service radiotelegrams transmitted by mercantile ships, for their part, will have precedence over communication practice among the wireless stations of the Navy, except during the hours applied for by the Naval authority.

ART. 4.—When it is desired to communicate with a land radiotelegraph station, the nearest one must be chosen. There being a range assigned to a distant land radiotelegraph station, it is necessary to wait until this is the nearest.

Length. of Wave.	Current Wave Amperes.	Decrement.	Reading of the wavemeter.	
			Principal Wave.	Next wave to the principal one.
600 metres 300 metres				

ART. 5.—Every station is obliged not to interfere with the communication of the other stations. To this end it is prohibited to exchange conversations not connected with the service among operators.

Likewise it is prohibited to send long series of signals for the syntonisation of the transmitting and receiving apparatus, these operations to be made by means of the trial vibrator. Where it is absolutely necessary to send trial signals, these should be confined to short series, and only after verifying that no other communications are being sent.

ART. 6.—Before starting a call, the wireless station will syntonise its receiver to the regulative wave and will at the same time verify that no communication is being made; otherwise will await the first suspension, unless its call does not disturb the said communication. The same rule will be observed when a call from another station is to be answered.

ART. 7.—(a) Calls for help have priority over all other signals.

(b) As soon as the call for help is perceived all communications will be suspended and will not be resumed until the ship applying for help has finished transmitting its signal.

(c) When a ship making use of the signal for help, adds, after a series of these signals, the characteristic of a certain station, the obligation of answering devolves in the first place upon the said station.

(d) When there is no such indication of characteristic, every vessel perceiving a call for help will answer it immediately. By so doing interference from other radiotelegraph stations will be avoided.

(e) Only one ship must answer at a time.

(f) That ship which believes itself nearest to the danger will take precedence in its communications over the others (if there are any).

ART. 8.—Those regions wherein the radiotelegraphic service is very considerable (Mancha Sea, etc.), a ship's call to a land radiotelegraph station will, generally speaking, not be made except when the latter is within normal distance of the ship radiotelegraph station, and when the ship reaches a distance inferior to 75 per cent. of the normal range of the said land radiotelegraph station.

ART. 9.—When two or more ships call at one time, the nearest land radiotelegraph station will indicate the order in which the radios are to be transmitted, paying attention to the convenience that the interchange of messages is the maximum, and giving preference to the ship which by its position, destination and speed, will be the first to leave its radius of communication.

ART. 10.—(a) If in spite of the precautions indicated, interference in the radio communications are produced, the land radiotelegraph station, to which the previous article refers, will give the order to wait, giving the approximate duration, and the ship stations are obliged to obey the order.

(b) The ship station will inform the land station of the moment in which it proposes to suspend its communications with other stations, as well as the probable duration of the interruption.

(c) To this respect, it must be borne in mind that the land station is the one which has the command of the communications.

ART. 11.—In case of repeated omissions to comply with this regulation on the part of foreign vessels in communication with the Chilean coast, the necessary steps to punish the culprit will be taken with that Government

under whose flag the ship sails. It is the duty of operators on board the Chilean mercantile vessels to record such omissions on their logs, and inform the captains, in order that they may lay these facts before the Naval Authorities.

ART. 12.—The land wireless stations, as it has been directed, will command the public radiotelegraphic service within the radius of its range, excepting the central region of the country, where the said command is performed by the controlling station. In case of danger, the ship station which sends danger signals is the one that commands the communication.

ART. 13.—In the Chilean coasts, in case of war, mutinies, or others to be dealt with by the Naval Authorities, the Chilean fleet will take command of the radio communications in those regions in which they are operating. In such circumstances, all ships, either foreign or Chilean, will obey the orders emanating from the said fleet.

ART. 14.—The radio stations are obliged to send the radios when no direct communication can be established between the station of origin and the receiving station, provided that they are in the position of being able to send them.

ART. 15.—(a) Those radiotelegraphic installations on board merchant vessels anchored in the ports of the Republic, where there is a land station, cannot be used for communication with ships other than through the medium of the land station, except in the case of signals for danger.

(b) Any talk, discussion or superfluous signals through the radiotelegraph is strictly prohibited, the communication is to be limited to what is necessary for a good service.

(c) Similarly, it is prohibited to interrupt a conversation between two stations in order to call a third one, save in the case of danger, or when it is a question of a call for "general stop." In such cases it will be necessary to wait till the transmitting station has finished, to begin immediately afterwards the call in question.

(d) All communications, except in the case of signals for help or danger, are prohibited, when the ship is anchored in any part of the Republic.

CHAPTER II.

ACCEPTANCE, TAXATION AND PAYMENT OF RADIOTELEGRAMS.

ART. 16.—(a) It is prohibited either to add to, or withdraw any words or punctuation signs from the messages, it is only allowed to add the customary notations of the service.

(b) When the message has not been written on the radiotelegram regulation form, the paper containing it will be affixed to the said form.

(c) When the drawing up or writing of a radiotelegram is not sufficiently legible, the radiotelegraphist will call the attention of the sender in order to make the respective corrections. A similar procedure he will observe in case of there being errors in the spelling.

ART. 17.—The messages will be classified in three categories, namely:—

(a) Officials.—Those from the Government, Commander-in-Chief of the Fleet, Commander-in-Chief of the Land and Diplomatic Forces.

Those relating to the safety of the State or public order, and those of exceptional urgency, such as wrecks, fires, earthquakes, or other calamities, communicated by the authorities, or addressed to them, and the replies to them.

(b) Service.—Those received from the inspectors and sub-inspectors of the national radiotelegraph service; those exchanged by the captains between one ship and another, for mutual information concerning the conditions of the navigation; those exchanged by the captains with the maritime authorities, or *vice versa*, with the same object; those radios of the service not rated as well as the meteorological ones.

(c) Private.—Those intended for public correspondence. In these are included press messages and rated service notices.

ART. 18.—Generally, the radiotelegrams are transmitted in the order that they are received; but subject to their category, the following scale will be adopted:—

(a) Official radios, priority to urgent ones.

(b) Service radios, priority to urgent ones.

(c) Private radios, priority to urgent ones.

ART. 19.—(a) Every national ship in communication with any station, will number each radio, beginning with number 1 to 0 hours of the first day of each month. This number will be determined in accordance with the order set out in the previous article.

(b) In the retransmission of messages, two numbers will be sent as a maximum; first, the number of the original station, and, second, that of the station concerned, and separating both by a fraction mark.

ART. 20.—The parts composing a message, in the order of their transmission, are as follows:

(a) Preamble and special remarks not rated.

(b) Special remarks rated.

(c) Address.

(d) Text.

(e) Signature.

ART. 21.—The preamble is composed of:—

(a) Prefix:—These are—"S" for official radios; "A" for service radios; "ST" for rated service radios; "Z" for press radios; and "D" for urgent radios.

(b) Name of the office of destination.

(c) Word "of" followed by the name of the office of origin.

(d) Number of the radio's origin.

(e) Number of rated words.

(f) Total number of rated and unrated words.

(g) Date and hour handed in. The hours are counted from 0 to 24, beginning at midnight.

(h) Special remarks not rated, such as:—Route to follow, course followed (when it is not clear), wording maintained (when it is confused).

ART. 22.—Following the preamble and before the address, the rated special remarks, are transmitted, as—"RP" "fr"..... reply paid..... words.

These remarks are rated and count as one word.

ART. 23.—The address is made up of:—

(a) Name of the addressee; and

(b) Place of destination and address, and other indications for facilitating the delivery of the radio (in accordance with the international list of offices).

ART. 24.—The text of a radio telegram can be rendered:—

(a) In a known language.

(b) In secret language. The latter is divided into agreed code and cipher code. The messages might be set out entirely in either one of these languages, or in conjunction with one another.

ART. 25.—The signature, as also the address and the text, must be written in legible form.

The signature is not compulsory.

ART. 26.—(a) Address.—As concerns the rating of the words, this will be as follows:—

(1) All the words written by the sender to be counted.

(2) The name of the station or office of destination will be counted as one word, whatever the length.

(3) When the name of a country, province, department, etc., or district (shown in the International List) is added, to distinguish one office from another of the same name, the words will be joined together to form one, which will be transmitted and rated as one word.

(4) The name of a country or district will be charged for if the sender should add it on unnecessarily.

(5) The remainder of the address will be charged for in accordance with the rules for counting the words in common language.

(b) Text.

(1) *In common language*.—The maximum of letters allowed per word is 15; if a word is composed of more than 15 letters it will be charged for as two words.

Those words from which one or two letters have been suppressed as against the use of the language will not be admitted.

(2) *Agreed Code*.—In agreed and commercial codes, recognised by telegraphic administrations, messages are counted and charged for at the rate of 10 letters per word.

(3) *Cipher Codes*.—In secret and cipher codes messages are counted and charged for at the rate of 5 letters or numbers per word.

(c) *Signature*.—The signature, when it is sent, will be charged for in accordance with the rules given for the common language.

ART. 27.—(a) Ordinary compound words and names of towns, provinces, countries, etc., as well as names of ships, or families, will be charged for as a word, when they are joined (without dash), and provided that they do not contain more than 15 letters.

(b) Compound words joined with a dash or apostrophe, are counted according to their number; the dashes or apostrophes will be charged for as additional words, should the sender insist on their transmission.

(c) When the name of a street, circus, etc., is made up of several words and written as one, it will be computed as one word, provided it does not contain more than 15 letters; but the expression "calle," "plaza," "avenida," "street," "strass," "rue," "boulevard," etc., will be counted as one additional word for the purposes of the rating.

(d) In German and Dutch languages the words strasse, platz, stratt, can be joined to the name of the street or circus, and then, they will not be charged as additional words if the combination does not exceed 15 letters.

(e) Compound numbers, in a form contrary to the general use of the language (for example, doscientos diez), will be admitted as only one word when they do not exceed 15 letters.

ART. 28.—(a) Radios set out, partially in ordinary language and partially in code, will be charged at the rate of 10 letters per word in both cases.

(b) The groups in cipher code, sent in this class of message, will be counted at the rate of five dollars or ciphers per word.

(c) When a radio is entirely written in ordinary language and cipher groups, the first will be counted at the rate of 15 letters per word, and the second at the rate of five (letters or ciphers) per word.

(c) EXAMPLE OF COMPUTATION OF WORDS:—

Words.	Number of Characters.	Number of words rated.	
		Address.	Text.
New York	—	1	2
Newyork	—	1	1
London England (word England unnecessary)	—	2	2
Peña Blanca San Fernando (name of an office) ..	—	1	4
Calle Barros Arana	—	3	3
Calle Barrosarana	—	2	2
Callebarrosarana (contrary to the use of the language)	—	2	2
Leipziger Platz	—	2	2
Liepzigerplatz	—	1	1
Kronprinzessin Cecilie DKA (name of an office) ..	—	1	3
Maipo CAB or Maipo CBU (name of an office) ..	—	1	2
Kronprinzessin Cecilie	21	1	2
Van de Brande	—	3	3
Vandebrande	—	1	1
O'Higgins	—	2	2
Ohiggins	—	1	1
13½	5	1	1
133½	6	2	2
137th or 1374°	5	1	1
1374th or 1374me	6	2	2
106A number of a house)	4	1	1
46231	5	1	1
46'231	6	2	2
29/32	5	1	1
34'38	5	1	1
2 %	4	—	1
2 p %	—	—	3
197A/199A (company mark)	9	2	2
Ch23 (company mark)	4	—	1
G.H.F. (company mark)	6	—	2
GHF45 (company mark)	5	—	1
2 p.m.	—	—	2
2.15 p.m.	—	—	2
N42E (demarcation of a ship) (three groups) ..	—	—	3
75°23 O. 24°15 S. (position of a ship) (four groups)	—	—	4
158°12 E. 24°15 S (position of a ship) (five groups)	—	—	5
Radiotelegraphy	16	2	2
Radiotelegraphy (underlined)	—	3	3
Sextyzlarg (ciphered code)	11	—	3
398499 (ciphered code)	6	—	2
23877 (ciphered code)	5	—	1
Accentuated (agreed code)	10	—	1
Electricano (agreed code)	11	—	2
(For example)	—	—	3
"Mercurio" (the inverted commas counting as one word)	—	—	2
? Por que ? (each sign of interrogation is counted as one word)	—	—	4
Dieciocho	—	1	1
Diez y ocho	—	3	3
Cientoochenta (international computation)	—	1	1
Cientochenta (contrary to the use of the language) as per the State Telegraph	—	2	2
Sinembargo	—	—	1
Aujourd'hui	—	—	1
Aujourd'hui	—	—	2
Formula b	—	—	2
E M (isolated letters, initials of surname)	—	2	2
EM (ditto, joined abusively)	—	2	2
A bordo	—	2	2
Abordo	—	1	1
Enseguida	—	—	1
Contralmirante (contrary to the use of the language) ..	—	2	2
Contralmirante	—	1	1
Aunque	—	—	1

ART. 29.—(a) The dashes or strokes that are only intended to separate the different words or groups composing a radio are not to be transmitted or charged for.

(b) Punctuation signs, apostrophes or dashes (except when used in the formation of numerals, commercial marks, etc.), will only be transmitted if the sender desires it; in such a case the said signs will be counted and rated as isolated characters.

(c) When a word or phrase is underlined, it is rated and counted as an additional word.

(d) The two parenthesis signs, () and the inverted commas " " will be counted as one word.

(e) Interrogation ? and exclamation ! signs will be counted as one word.

ART. 30.—(a) *Isolated characters*.—Whether a letter or cipher, it will be counted as one word.

(b) *Groups of characters*.—(Letters or ciphers).—Those groups of letters forming commercial marks, or expressions, such as, CIF, FOB; groups of letters of current use, such as RSVP, RIP, QEPD, and groups of ciphers, will be counted at the rate of five letters or ciphers per word.

(c) *Combined groups of characters*.—(Letters and ciphers).—Combinations of ciphers and numbers forming commercial marks, or number of a house, such as B Bis, OA₃ 13A, will likewise be counted at the rate of five characters per word.

(d) *Groups in the Address*.—Such will not be accepted and any other letter in excess of those forming names or words, will be surcharged and counted as separate words.

(e) *Letter Ch*.—The combination of Ch, which is counted and transmitted as only one letter in the ordinary language message, or agreed code of words in a known language, will be rated as two letters in those of cipher and agreed code formed by words of no particular language.

(f) *Groups with punctuations, signs, and fraction marks*.—The groups wherein appear full stops, commas, dashes and fraction marks to form commercial expressions will each be counted as one letter or cipher.

ART. 31.—The rates payable in the Chilean coast will be as follows:—

(a) By merchant ships the rate of 40 centimes per word, with a minimum value correspondence to ten words.

(b) For land stations, at the rate of 60 centimes per word, with a minimum value corresponding to ten words.

ART. 32.—(a) *Radios exchanged between two merchant ships*.—The rate for the radios exchanged between merchant ships, without the intervention of a land station, will comprise the rates on board the ship of origin and destination, supplemented with the rates on board the intermediary stations.

(b) *Radios from a mercantile ship to a land station*.—When a radio sent from a ship to a land station passes through one or two ship stations, the rate includes, besides that of the ship of origin, that the coast station and that of the telegraphic lines, the rate on board of each of the ships that have taken part in the transmission.

(c) *Radios from a merchant ship to a warship, or vice versa*.—The radios exchanged between a merchant ship and a national warship, will be subject to the same rates as above, except when it concerns officials, classes or crews of the warships, in which case these will only pay the corresponding tariff to the merchant ship

and that of the warship, which is 500 centimes per word.

(d) *Reply paid*.—Private radios with reply paid, besides the rate for sending the radio, will pay the corresponding amount for the said reply.

ART. 33.—Any difficulty that may arise in rating private radios, in other cases than aforementioned, will be dealt with in accordance with Articles 16, 17 and 18, Chapter IV, of the Service Regulations annexed to the International Radiotelegraph Convention.

ART. 34.—Shipowners, proprietors, or shipping companies will render monthly their accounts to the General Direction of Telegraphs, when their ships have sent messages through the medium of the land stations, or by way of the State Telegraph lines.

ART. 35.—(a) *Radio Record Book of the Station*.—In this book will be noted the following particulars of the radios: Number of origin, total number of words, hour handed in, situation of the ship of origin, if known, hour of transmission, hour of reception, special remarks and signature of the operator. The text will not, therefore, be written.

(b) *Filing of radios*.—The originals of the radios, together with the documents relating to them, will be kept at least eighteen months in the station of the ship.

CHAPTER III.

TRANSMISSION AND RECEPTION OF RADIOS.

ART. 36.—(a) The International Morse Code signals will be used, and the speed of transmission will be more or less 20 words per minute, reckoned at the rate of five letters per word.

(b) The International Code of Signals which was originally prepared for flag signals is sometimes used in radiotelegraphy between ships of different nationalities.

(c) For notices and enquiries of the service, the operators will make use of the Radiotelegraphic Code of Abbreviations annexed to the Service Regulations of the Radiotelegraphic International Convention.

ART. 37.—The following signals will be used:—

- (a) Preliminary call — — — — —
- (b) Separation — — — — —
- (c) Invitation to transmit — — — — —
- (d) To wait — — — — —
- (e) Acknowledge receipt — — — — —
- (f) End of transmission — — — — —

ART. 38.—(a) The calls consists of:—

- (1) The preliminary call — — — — —
- (2) The characteristic of the destination station, repeated three times, and
- (3) The word "of" followed by the characteristic of the transmitting station, repeated three times.

(b) The destination station replies as follows:—

- (1) Preliminary call — — — — —
- (2) Characteristic of the original station, repeated three times.
- (3) Word "of" followed by its own characteristic.

(4) Invitation to transmit — — — — — in case it is ready; otherwise, the signal to wait — — — — — followed by a cipher, indicating the number of minutes he has to wait.

- (5) End of transmission — — — — —

ART. 39.—The steamship *Maipo* "CDH" wishes to transmit a radio to the steamship *Cachapoal* "CDF."

(a) *Call*.—The *Maipo* will send the following signal: — — — — —

CDF CDF CDF — — — — — CDH CDH CDH

(b) Reply.—The *Cachapoal* will reply :

(1) —●—●—●— CDH CDH CDH —●—●—
CDF —●—●— in case it is ready for communication.

(2) Otherwise, if the stop is of five minutes, will reply :

—●—●—●— CDH CDH CDH —●—●—
CDF —●—●—●—●—●—●—●—●—●—●—

ART. 40.—If after having repeated the call three times, with an interval of two minutes the station of origin does not receive a reply it will call again in the same manner after 15 minutes, provided that no other communication is being sent.

ART. 41.—Every station on board that calls a land station, after complying with what is set out in Art. 39, will make known :—

(a) The distance of the ship, in nautical miles, from the coast station.

(b) The position, in concise form.

(c) The next port it is making for.

(d) The number of radios of normal size, if they are of exceptional length, or the number of words.

(e) The speed per hour will not be indicated unless it is expressly asked for by the coast station.

ART. 42.—The ss. *Maipo* "CDH," on a voyage to Callao, is situated at 150 miles to the North of Valparaíso, CCE station, the radiotelegraph station being at 170° exactly, and has 75 words to be transmitted.

After calling and receiving the invitation to transmit, it will act as follows :—

—●—●—●— CCE from CDH —●—●—●—
QRB 150 QRC 170 QRD Callao 75
—●—●—●—

Such communication is called time rush ("T R"), and appears jointly with QRB QRC and QRD in the abbreviations list annexed to the present Regulations.

ART. 43.—The reply from the land station may be in any one of the following examples :—

(a) —●—●—●— CDH from CCE R TR
50 QSG —●—●—●— (meaning "time rush received. I have radios with 50 words for you ; transmission will be made by a series of radios)."

The station on board will acknowledge receipt, and the one on land will transmit five radios, provided such transmission does not exceed 15 minutes.

(b) —●—●—●— CDH from CCE R TR 50
QSG —●—●—●— (signifying: "received time rush. I have radio with 50 words ; transmit").

The station on board will transmit the five messages, provided it does not take longer than 15 minutes in transmitting it.

(c) —●—●—●— CDH from CCE R TR 50
QSF —●—●—●— (meaning: "received time rush. I have radios for you with 50 words ; will transmit messages, alternating with one another").

The station on board will acknowledge receipt and that on land will transmit its first message ; the ship will forthwith acknowledge receipt again, transmitting in its turn its first message, and so on alternately.

(d) —●—●—●— CDH from CCE R TR 50
QSF —●—●—●— (i.e., "received time rush. I have radios for you with 50 words ; the transmission will be made alternatively. You first."

The station on board will begin the transmission of its first message, and once the acknowledgment is given by the coast station, this, in its turn, will proceed to give its first message.

When radiotelegrams are exchanged between two ships the fixing of the order of transmission devolves upon the ship called up.

ART. 44.—(a) Every transmission of messages will be preceded by the signal —●—●—●— and ended by —●—●—●— followed by the characteristic of the station of origin and the signal —●—●—

(b) When messages of over forty words are transmitted, the station of origin will be able to interrupt the transmission by using the sign of interrogation —●—●— after each series of twenty words, and will not be able to begin again while the station of destination does not repeat correctly the last word, followed by the invitation to transmit —●—●—

(c) In the transmission of series of messages, the characteristic of the station of origin and the signal —●—●— will only be given at the end of the said series.

ART. 45.—After assigning to the radio the number corresponding to it, and verifying the number of words and hour handed in, the transmission of the message will be proceeded with as follows :—

(a) Process.—Signal of preliminary call, prefix (if there is any), radio number of the ship or origin, number of the radiotelegram, number of words, date and hour handed in, service instructions (if there is any), separation signal, eventual observations (if any), separation, address, separation, text, separation, signature, sign of the end of the message, characteristic of the station (ship) transmitting invitation to transmit.

(b) Example.——●—●—●— radio Aysen, 1-10-12 (12th day of the month) 9-35 (9-35 hours) —●—●—●— Gutiérrez, Prat Street, Valparaíso —●—●—●— will arrive to-morrow at 3 p.m. —●—●—●— Gonzalez —●—●—●— CDB —●—●—

ART. 46.—Once the radio is assigned a number, it will be transmitted as follows :—

(a) Process.—Signal of preliminary call, prefix (if any, radio, number of the office of origin, number of origin, followed by fraction mark and number assigned to the radio by the land station, number of words, date and hour of deposit, instructions of service (if any), separation, eventual indications, separation, address, text, signature, signal of end of message, characteristic of transmitting station and signal of invitation to transmit.

(b) Example.——●—●—●— radio Valparaíso, 915-1 13-12 12 9-35 —●—●—●— Riveros Aysen Valparaíso —●—●—●— will go on board to meet you. Please take freight No. 215bis —●—●—●— Gomez —●—●—●— CCE —●—●—

ART. 47.—Presume that the ship *Huasco* retransmits the official message No. 5, with 16 words, as per telegraphic computation, but with only 13 actual words, which was deposited in the wireless station of the cruiser *Chacabuco*, on the 12th day of the month, at 9-35.

(a) Process.—Signal of preliminary call, prefix "S," radio, name of office, ship or station of origin, number of the radiotelegram, number of words, date and hour handed in, service instructions, separation, incidental remarks (if any), separation, address, separation, text, separation, signature, end of message, characteristic of the transmitting station, signal of invitation to transmit.

(b) Example.——●—●—●— S radio *Chacabuco* 5-16-13 12 9-35 via steamship *Huasco* —●—●—●— General Director of the Navy, Valparaíso —●—●—●— Fleet anchored safely

cymrxz ohtlrd cadmzw —●●●●— Admiral
Gomez ●●●●● CDC —●●●●—

ART. 48.—(a) When a radio is received, the words will be counted, and if this coincides with the number given, an acknowledgment of receipt in conformity will be sent, using the letter R, followed by the numbers of the message, as follows:—CDC ●●●● 19 CDH (station of origin. Received in conformity. Station of destination).

(b) The acknowledgment of receipt in the messages by series will be given after the transmission of each radio.

ART. 49.—The date and hour will be pointed out by means of two groups of ciphers, the former being transmitted first, and then the latter with its minutes.

Thus, the 12th day, 2.45 p.m., will be transmitted as follows:—

12 14 45

ART. 50.—When the quantity of words is different to that rated, it will be marked out as a fraction, first transmitting the number of words rated followed by the fraction mark and by the true number of words.

If a message has 20 words, but for the purposes of rating is counted as 22, it will be transmitted as follows:—

22 —●●●●— 20

ART. 51.—(a) The end of the correspondence between two stations will be marked out by the signal ●●●●— followed by the characteristic of the transmitting station.

(b) It is strictly prohibited to use the word "nil."

ART. 52.—(a) Example of transmission:—

(1) *Message.*—On November 4th, the Chilean s.s. *Huasco* wishes to transmit to the land station at Valparaiso the following message: No. 16; hour of deposit, 2.15 p.m. Number of words rated, 15; actual number, 13.

Jiménez—Echaurren 516 Santiago—Buy 100 coal shares "Curanilahue" price 162½—Gonzalez (inverted commas maintained by the sender).

(2) *Transmission.*—Such message will be transmitted as follows:—

—●●●●— radio Huasco 16 15/13 4
1415

—●●●●— Jiménez Echaurren 516
Santiago.

—●●●●— Please buy 100 coal shares
Curanilahue.

—●●●●— price 162 one/2 —●●●●—
Gonzalez ●●●●●

(b) *Reception in conformity.*—The receiving station will, after verifying the number of words, transmit the acknowledgment of receipt, as follows:—●●●●— CDC —●●●●—
R 16 15/13 ●●●●● CCE —●●●●—

In the case of messages having words in code these will be repeated when acknowledging receipt.

(c) *Reception not in conformity.*—

(1) Doubtful reception of a part of the message.

If by any circumstance the words following "carboníferas" (coal) are not received, the repetition will be asked for, thus:—

CDC —●●●●— carboníferas (coal)

●●●●● CCD —●●●●— The transmitting

station will reply CCE carboníferas (coal)

●●●●● Curanilahue ●●●●●

price 162 one/2 —●●●●— Gonzalez

●●●●● CDC —●●●●—

(2) *Error in the number of words.*—If the receiving station is not agreed upon the number of words, it will signal it thus:—

●●●●● CDC 14/12 ●●●●●

CCE, presuming it has not received the word 162.

The transmitting station will repeat the message, giving only the first letter of each word, so as to enable the receiving station to verify where the mistake is and ask for a repetition accordingly.

ART. 53.—(a) When the signals are doubtful and weak every device must be taken to effect the transmission.

(b) The last radio can be repeated as much as three times, if the receiving station so demands, and, if in spite of such threefold repetition the signals are still illegible, the message will be given up as cancelled.

(c) If no acknowledgment is received, the transmitting station will call as many as three times, and failing to receive an answer the communication will be abandoned.

In such cases the transmitting station has the right of obtaining an acknowledgment by a service notice sent through the intermediary of another station in the country, or even by utilising the telegraphic lines of the State.

(d) If, in spite of the bad reception, the receiving station esteems that the message could be sent, the acknowledgment will be given, adding at the end of the preamble the words "doubtful reception."

(e) In the event of the ship transmitting again the radio to another station of the same administration, only the rates corresponding to one transmission will be charged.

ART. 54.—When a radio contains numbers, difficult names or doubtful words, it will be transmitted slowly in order to avoid errors.

All doubtful words and numbers will be repeated on acknowledging receipt.

ART. 55.—All radios in Code will be repeated by the receiving station; this does not acknowledge it until it receives the confirmation of the transmitting station.

ART. 56.—(a) The preamble of a notice consists of:—

(1) The prefix A.

(2) Names of the offices (or stations) of destination and origin, separated by the word "of."

(3) The date and hour of deposit.

(4) Service notices do not bear either numbers or signature in the transmission, but it is the duty of the operator transmitting a notice to sign the formulary with his initials.

(b) In the text of a service notice exchanged between a ship and a land station, the radiotelegram, giving the notice of service, will be designated by:—

(5) The number of origin, and serial (as the case may be).

(6) The date written in words, and not in ciphers.

(7) The name of the addressee (and his address in case of non-delivery).

ART. 57.—(a) The station on board informs the station of origin that the radiotelegram could not be delivered to the addressee. —●●●●—
To Constitucion from ABC 15 11 55 —●●●●—
321 5 fourteen Guzman addressee is not on board ●●●●●

In this message Constitucion is the office of origin of the radiotelegram, which is informed that Guzman, the addressee, is not on board the ship, the characteristic of which is ABC. The ciphers 15 11 55 stand for the date and hour of deposit of the service notice; and the word "fourteen" (catorce) gives the date of the radio under consideration, whose number of origin is 321, and the serial assigned to it in the land station is 5.

ART. 7.—For the efficient working of the school the following documents and books will be kept :—

(a) Investment of money. In this book will be entered in detail, supported by its respective voucher, every expense incurred, either in salaries of the staff or in appliances for the course.

(b) Statistics of operators, examinations and titles.

(c) General attendance.

(d) Notes of conduct and advancement in the various subjects.

(e) File of communications sent.

(f) File of communications received.

ART. 8.—The duration of the course for operators of the National Mercantile Navy will be as indicated in the table below, *i.e.*, eight months comprising 400 hours of instruction :—

The above periods will be distributed as follows :—

Periods.	Duration in months.	From	To
Preparatory	3	1st August ..	31st October
Theoretical	3	1st November	31st January
Practical	2	1st February	1st March

(a) *Preparatory*.—This will comprise, in accordance with the syllabus in the appendix, the following subjects :—

Revision of arithmetic, and algebra, electricity and Morse.

At the end of such period, a partial examination will be taken to select those students, who, in the opinion of the teaching staff, have not sufficient knowledge to go on.

(b) *Theoretical*.—The subjects dealt with in the previous period (excepting arithmetic and algebra) will here be extended and the subjects of electricity and radiotelegraphy will be taught.

(c) *Practical*.—The teaching of Morse will here be continued, and the students will receive instruction in the practical handling of a radiogram, the practical workshop and regulations.

ART. 9.—As the object of this course is to meet the requirements of the daily life imposed on the students, the classes will be held after working hours, and in accordance with the time table set up by the directing staff.

ART. 10.—The course will have a capacity for 40 students, in order that there are not less than 50 per cent. when the selection is made at the end of the first period.

ART. 11.—Such faults as may be committed by the students will be punished in accordance with their gravity, as follows :—

(a) Simple reprimand by the instructor.

(b) Severe reprimand by the director, in the presence of the rest of the students.

(c) Expelled from the course, which will be decreed by the Maritime Territory Direction, upon the advice of the director of the course.

CHAPTER II.

ADMISSION OF STUDENTS.

ART. 12.—Those candidates who wish to study the Course for operators of the National Mercantile Marine, could present themselves to the examination for admission, on application on sealed paper (in accordance with the Stamp Law) to be addressed to the Maritime Territory Direction in the first fortnight of the month of July, and must fulfil the following requirements :—

(a) To be Chilean or nationalised, in compliance with the laws of the Republic.

(b) To be of any age between 18 and 30 years, attested by the respective birth certificate.

(c) To appear in the Military Register, or to have complied with the Law of Recruits and Deputies, supported by the respective documents.

(d) To be healthy and of good constitution consistent with the life on board and that calling.

(e) To exhibit proofs of good conduct and character, by means of certificates from the school where educated and from past employers.

(f) To have been vaccinated, or to have had smallpox. N.B.—The application must contain the address of the person concerned.

ART. 13.—(a) The Maritime Territory Direction will communicate with the applicants, advising their acceptance or rejection, before the 25th July.

(b) In such communications the candidates accepted will be told the date, hour and place of examination.

ART. 14.—All candidates will be submitted to an oral or written examination dealing with the following subjects :—

(a) *Arithmetic*.—The four simple rules, decimals and fractions, metrical system and some other easy problems in connection with the application of these rules.

(b) *Spanish*.—To read and write correctly, and to compose clearly.

(c) Any advanced knowledge possessed by the candidate in grammar, electricity, signals, Morse telegraphy and languages, will be recorded.

ART. 15.—The examinations for admission will be carried out by a commission composed of the following persons :—

(a) *In Valparaiso*.—The director of the course, the instructor in radiotelegraphy, and the instructor of Morse.

(b) *In the naval stations*.—Two officials and one naval operator appointed by the Commander-in-Chief.

ART. 16.—(a) The duration of the examination will be that which the commission thinks necessary to give them an idea of the knowledge and aptitudes of the candidate.

(b) The marking for the examinations, both written and oral, will be secret, from 0 to 10, 0 signifying "poor," 5 "fair" and 10 "very good."

The intermediary numbers serve for graduating the differences.

(c) To pass, the candidate must obtain a sufficient majority of marks.

ART. 17.—The commission will draw up a report of all the proceedings, which will be signed by each one of its members, wherein will be noted :—

- (a) The candidates presented.
- (b) The candidates passed, and
- (c) Those rejected, will take back their papers.

CHAPTER III.

EXAMINATION OF THE STUDENTS.

ART. 18.—(a) As laid down in Clause (a), Art. 8, of the present regulations, an examination—in the subjects appearing in the first part of each syllabus—for selecting the students, will take place at the end of the first period of instruction.

(b) This examination of selection will be performed by the directing staff of the school, and the word "passed" or "rejected" will be sufficient for the student continuing the course or being definitely excluded from it.

(c) Immediately the examination is carried out, the director of the course will get into communication with the Maritime Territory Direction.

ART. 19.—(a) At the end of the third period, the final examination, both written and oral, will take place, of which function the Maritime Territory Direction will be informed by the director of the course.

(b) The Maritime Territory Direction will fix the date for the examination, appointing such delegate as he esteems best, for him to be present at the said examination and to sign the proceedings.

ART. 20.—(a) This will be composed of, besides the delegate, the members appearing in Clause (a), Art. 15, of the present Regulations.

(b) The marking will be governed by that laid down in Clauses (b) and (c), Art. 16, of the present Regulations.

(c) The acts of the examinations will be drawn up in accordance with Art. 15 of the present Regulations.

ART. 21.—The duration of the final examinations will be at least that which is given below :—

- (a) For electricity : 20 minutes.
- (b) For radiotelegraphy : 30 minutes.
- (c) For Morse : 15 minutes.

ART. 22.—As soon as the examinations are finished, the results will be communicated to the Maritime Territory Board by the director of the course, who will enclose a copy of the proceedings with the order of merit of the examinees.

ART. 23.—(a) With the results of the examination before him, the Maritime Territory Director will issue the titles of Second Class Operators to the students approved, fixing the order of priority according to the average note.

(b) Such priority is established as an appreciation of the capacity of the operators.

CHAPTER IV.

EXAMINATION FOR SECOND AND FIRST CLASS OPERATORS.

ART. 24.—Every person who, without having gone through the course laid down in these Regulations, wishes to secure a post of Second Class Operator in the Mercantile Navy, should apply to that effect to the Mercantile Territory Director, requesting that such an appointment be granted to him by the commission of examinations concerned.

The applicant must fulfil the conditions laid down in Clauses (a), (b), (c), (d), (e) and (f), of Art. 12, Chapter II of the present Regulations.

ART. 25.—(a) The Maritime Territory Director will supply the application form, and with

it, if the decision is favourable to the applicant, call a meeting of the commission of examinations, which, if there is no school, will be composed of the radiotelegraphy inspectors, his assistant and an operator.

(b) The subjects to be dealt with in the examination will be those given in the syllabuses of the present Regulations.

(c) The marking and other processes will be the same as those laid down in Arts. 14 and 15 of the present Regulations.

(d) The candidates passed in this examination will receive from the Maritime Territory Direction the title of Second Class Operators.

ART. 26.—Second Class Operators can be promoted to First Class Operator, if they are able to comply with the following requirements :—

(a) Two years at least at sea, having served actively in radiotelegraphic stations on board a ship. This time to be supported by certificates on official lines written out by the commanders under whom served.

(b) To have observed good conduct, and fulfilled technical obligations.

(c) To address an application to the Maritime Territory Director, requesting an appointment by the commission concerned.

The applicant to be able to fulfil the requisites enunciated in Clauses (a), (b), (c), (d), (e) and (f) of Art. 11, Chapter II, of the present Regulations.

ART. 27.—(a) The conditions of the examination will be the same as those laid down in Art. 24, Clauses (a), (b) and (c), except that the candidate will be required to be able to do a speed of 20 words per minute in the transmission and reception of messages, reckoned up at the rate of five letters to a word.

(b) The candidates passed in this examination will obtain from the Maritime Territory Director the appointment of First Class Operators.

ART. 28.—All operators' titles will be valid for five years, these being withdrawn if the person concerned fails to comply with the requirements set out as under :—

ART. 29.—The operators' titles in the Mercantile Navy will be withdrawn if the operators during two years have not served as such for six months at least.

ART. 30.—Similarly, the operator might be suspended temporarily, or his title be definitely withdrawn from him by the authority who gave it to him, who is suffering from ear troubles, or condemned for guiltiness or negligence, asserted by competent persons, or to whom it is proved, by opening an inquiry, deficient professional preparation, dishonesty, drunkenness, immorality, or other serious delinquencies.

CHAPTER V.

REPETITION COURSES AND REQUALIFYING FOR TITLES.

ART. 31.—Subject to the sanction of the Maritime Territory Director who forms part of the course for refreshing the knowledge of the students, the persons named in the preceding article, who should consider themselves going through a course of repetition, will be admitted to the operators' school.

ART. 32.—The course of repetition may be composed of the following persons :—

(a) Retired operators from the Navy who apply to that effect.

(b) Mercantile operators who, having given up, temporarily, their profession, wish to renew their knowledge to return to it.

(c) All operators in active service who, having the necessary time to spare, so desire.

ART. 33.—The conditions for the repetition course will be the same as those set up in Chapter III of the present regulations for school members.

ART. 34.—Every operator wishing to requalify for the title, owing to its validity having expired, must pass in the same manner and under the same conditions as the school members, the examinations prescribed in the present regulations.

APPENDIX.

SYLLABUS OF ORAL AND WRITTEN

EXAMINATIONS.

I.—ARITHMETIC.

First Period.

(a) The four simple rules, fractions and decimals.

(b) Problems in connection with the four simple rules.

(c) Weights and measures, metrical system.

(d) Problems on the metrical system.

2.—ALGEBRA.

First Period.

(a) Elementary rudiments, notations, signs, negative quantities.

(b) Addition, reduction of similar terms, negative quantities, unknown quantities.

3. MORSE.

(a) Characteristics and signs.

(b) Practice in transmission and reception until at the end of the first period a speed of not less than 10 words per minutes is reached, and at the end of the course, more than 12 words per minute. The number of words to be computed at the rate of five letters to a word.

To obtain the title of first class operator, the speed in transmitting and receiving must not be under 12 words per minute.

4.—ELECTRICITY.

First Period.

(a) Static electricity. Electric charges. Electrical field. Conducting and insulating bodies. Unit of quantity of electricity; the Coulomb. Electric potential. Electrical capacity; the Farad. Electric condensers. Discharge of the condensers. Coupling of condensers.

(b) Electrodynamics. Electric current. The ampere. Switches. Electrical resistance. The Ohm. Ohm's law. Simple problems of Ohm's law.

(c) Electrical cells. Electrodes. Characteristics of cells. Coupling of cells. Polarisation of cells. Depolariser.

(d) Electric accumulators. Electrodes, electrolyte. Process; its density. Modern accumulators. Charging and discharging process. Charge and discharge voltage. Capacity of an accumulator. Slight idea on the alkaline accumulator.

(e) Magnetism. Magnets. Magnetical induction. Magnetic and diamagnetic bodies. Magnetic field. Magnet making. Magnetic compass.

Second Period.

(a) Electromagnetism. Diversion of the magnetic compass by electric current. Right hand rule or amperes. Induction of solenoid coil. Electromagnet. Galvanometers. Ampermeters. Voltmeters.

(b) Electromagnetic induction. Dynamos. Working of a dynamo. Inductors. Induction. Commutators and its brushes. Double and multipole dynamos. Series shunt and compound dynamos. Characteristic of dynamos.

Sketch representing the dynamos. Installation of dynamos on board. Distribution board of the dynamos. Keys. Fuses. Lamps.

(c) Electric motors. Working. Counter E.M.F. Starter and field regulators. Sketch. Series, shunt and compound motors. Care and handling of motors. Generating motor of a wireless station.

(d) Working. Power. The watt; unit of power. The Joule; working unit. Horse power; unit of mechanical power.

(e) Transformers. Fixed and rotating transformers. Rule of transformation. Ruhmkoff's coil. Electric bells. Telephones.

(f) Inductance. Self-induction, or phenomena due to induction.

(g) Alternators. Frequency of alternating current. Currents of low frequency, high frequency and oscillatory current. Resonance and its object.

(h) Knowledge of electric conductors with and without insulation and the characteristics according to the S.W.G., and of the lead fuses in accordance with their diameter.

5.—RADIOTELEGRAPHY.

Second Period.

(a) Condenser. Oscillating discharge of the condenser. Oscillating circuit. Oscillators used in radiotelegraphy.

(b) Open-oscillating circuit or aerial. Radiation and propagation of the electromagnetic wave into space. Velocity of the electromagnetic wave. Wavelength. Damp and continuous waves. Decrement allowed.

(c) How the signals emitted by a transmitting station are received.

How the electromagnetic waves in the transmitting station are produced.

Wavelengths employed on steamer and coast stations.

Third Period.

(a) Circuit and general working of a radiotelegraphic station.

(i) Description of the continuous current circuit in the Valparaiso radiotelegraph station. Circuit of alternating current in the same station. Circuit of low frequency and high tension alternating current. Oscillating circuit and aerial circuit.

(c) Reception circuit. Idea of the magnetic detector and multiple tuner. Crystal detectors, and crystals used. Modern receivers. Idea of amplifiers.

(d) Handling and practical working of the transmitting and receiving apparatus.

(e) Main difference with other types of wireless sets.

(f) Preservation of the apparatus and testing.

(g) Practice in the workshop.

(h) Knowledge of the regulations.

REPUBLIC OF CHILE.

NATIONAL NAVY.

REGULATIONS FOR PRIVATE, AMATEUR AND PRACTICAL RADIOTELEGRAPH STATIONS.

D **ART. I.**—In accordance with Art. I of the Regulations of the Radiotelegraphic Service of the Navy, approved by Supreme Decree No. 164, dated 28th February, 1921, the Government will grant permission for the installation of private radiotelegraphic stations, exclusively destined to studies and experiments, provided that the stipulations of the present Regulations are adhered to.

ART. 2.—The power of the station not to be greater than 50 watts, measured at the terminals of the generator.

When oscillation (transmitting) valve is employed the power can be reduced, according to the requirements of the Radiotelegraphic Service.

ART. 3.—Any system of transmitter can be used, except that of direct coupling from the aerial to the oscillator.

ART. 4.—The maximum height and length of the conductor of an aerial will be 30 metres.

When two or more conductors are used, the height and length will be limited to 20 metres.

The length of the aerial will be measured from the leading-in insulator to its extremity.

ART. 5.—The longest wavelength that can be used in the transmission will be 200 metres.

The coupling between the primary and secondary of the transmitters will be such that the two waves produced by the aerial do not differ more than 10 per cent. from the longest.

ART. 6.—The logarithmic decrement of the oscillation of the transmitting aerial must not be greater than 0.2.

ART. 7.—Private stations possessing transmitters, must not be set up nearer than three kilometres from the Government stations.

When a new Government station is established licences to amateurs having their transmitting installations within a radius of three kilometres from the new station will be cancelled.

ART. 8.—The person who desires to install a private station should apply to the Ministry of the Navy, requesting the corresponding licence.

Such application will be handed to the Maritime Territory Director to be forwarded, and through the intermediary of the General Direction of the Navy, to the Ministry of the Navy.

In this application the person concerned will state, besides his name, his father and mother's surnames, nationality, age, profession, address, the locality in which he desires to install his station, and a detailed description of the installation, showing specially the type, power, aerial and purpose of the installation.

ART. 9.—On the receipt of such application the Maritime Territory Direction will, for its information, make sure of the following:—

(a) That the applicant has sufficient knowledge to handle his installation, and that he is capable of transmitting and receiving at least 10 words per minute.

(b) That the position proposed for the station complies with the requirements of the Regulations.

(c) That the system, power, aerial, etc., complies with the requirements laid down in the present Regulations.

(d) That the applicant is in the position to prove his identity by means of his identity certificate.

On registering this application it will also be designated with a corresponding number or mark.

ART. 10.—On the Minister of the Navy granting this licence, the Maritime Territory Director will send it to the Maritime Authority nearest to the place of the installation in order to be handed to the person concerned.

On the Maritime Authority handing the applicant the licence, the former will urge him to declare when he will start and finish his installation.

The licence will hold good for the term of five years, at the end of which the applicant if he so desires, will apply for an extension for another similar period.

ART. 11.—On receipt of the licence from the Maritime Authority the applicant must, under oath, undertake not to divulge the communications which he intercepts, and to use his installation solely for study and experiments, unless the empowered authority should urge him to disclose such communication as he intercepts, or to use the installation for other ends; or that the communications intercepted are of such a nature as to justify their being communicated to some authority in order to avoid misfortunes or other evils; or in the case of news of general interest, such as press or others of the kind.

The Maritime Authority will take down this oath declaration in writing and send it on to the Maritime Territory Direction.

ART. 12.—Once the installation is complete the Maritime Authority will inspect it and make sure that it complies with the requirements herein laid down, and if so, will authorise the working of the station.

He will give an account of all this to the Maritime Territory Director.

ART. 13.—Once the amateur is authorised to work the installation, he must not make any modifications implying changes neither in the power nor in the system of emission, without previous authorisation from the Maritime Territory Director.

ART. 14.—The granted licence only authorises its proprietor to operate with the transmitter of his installation.

ART. 15.—Private stations are subject to the inspections which may be ordered by the Maritime Territory Director.

ART. 16.—They are under the obligation of obeying the immediate orders issued by the stations of the Navy.

ART. 17.—All private stations are, as from the time they receive their licence, subject to the International Regulations and those of the Navy, and to the subsequent measures which the Government at any time might deem desirable to dictate.

ART. 18.—In the event of any breach in the Regulations, the Maritime Territory Director might order the closing up of a private installation and take the necessary steps to carry this into effect.

In such cases the Maritime Territory Director will inform his superiors, so that the cancellation of the corresponding licence may be granted by the Supreme Government.

ART. 19.—Concessions for the establishment of private stations will be considered as cancelled with the promulgation of the decrees ordering the partial or total mobilisation of either the Army or the Navy; in that event the Maritime Authorities who have issued the licences for the installation, will proceed without further steps to dismantle those stations, the apparatus of which to be placed under their custody or, if necessary, requisitioned and note of the proceedings to be taken in writing.

ART. 20.—The term "radiotelegraphic station" used in the present regulations applies not only to the installations completed, but also to those exclusively designed for receiving and transmitting, whether for radiotelegraphy or radiotelephony.

CHINA

(See Maps 17 and 20)

Including : Manchuria, Tibet and Mongolia.

THE Republic of China in its present form was established on October 10th, 1911. The constitution, drafted by the first Parliament, that met on April 8th, 1913, laid down the basis of government under which this great Republic is now governed. The executive power is vested in a President; whilst the legislative authority is exercised by a National Congress, comprising a Senate and a House of Commons.

CONTROL.

Radiotelegraphy in China is owned and controlled by the Government, and its administration is regulated by the Department of Telegraphs, Ministry of Communications. The Ministry of War and the Ministry of Marine control the use of Radiotelegraphy in the Army and the Navy respectively.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Admiral Y. L. Woo	Minister of Communications	Peking
C. T. Sun	Vice-Minister of Communications	Peking
S. Y. Tsoh	Director-General of Telegraphs	Peking
T. Song	Chief of General Sub-Department of Telegraphs	Peking
L. T. Chow	Chief of Traffic Sub-Department of Telegraphs	Peking
A. H. Eriksen	Adviser	Peking
A. Jørgensen	Wireless Engineer and Instructor	Peking
S. T. Dockray	Wireless Engineer	Peking
C. C. Casperd	Wireless Engineer	Peking

ORGANISATION.

The coast and inland stations administered by the Ministry of Communications are ten in number, including those of Woosung, Canton, Foochow, Shanghai, Tsungming, Wuchang, Kalgan, and Peking, of which the last five are coast stations open for public service, while the remaining three are official stations. Three new stations of the Marconi type (25 kW.) have been erected at Kashgar, Didwha, and Urga. One 50 kW. station and five 5 kW. stations will be erected in Yunnan Province. These stations will be of the Poulsen type.

At Peking, Woosung and Wuchang the existing Quenched-Spark system is being replaced by Transmitting Valves.

The Ministry of Communications contemplates the establishment of a central station near Shanghai equipped with two 1,000 kW. arc sets and branch stations in Harbin (200 kW. arc), Shanghai, Peking and Canton (each 100 kW. arc).

Experimental stations are installed in the Y.M.C.A. Head Office and the Universities at Nanyang, Peiyang and Chiaotung.

The Nanyang University also collects press messages transmitted from Europe, America, Honolulu and the Philippine Islands for dissemination to local newspapers.

The Ministry of Communications is considering draft regulations relating to broadcasting and private stations.

It has been proposed to erect several small stations of from 1½ to 5 kW. in Outer Mongolia and at some important points in Chihli Province.

The Naval Board has purchased a very large station of 500 kW. from a Japanese factory. The erection of this station was started in 1920.

A Radio Training Station was opened in Peking in 1913. It is controlled by the Ministry of Communications.

ADMINISTRATION.

At present radiotelegraphy in China awaits development and the laws and regulations affecting the subject consist, therefore, of those formulated to govern the working of the ordinary wired telegraph and telephone applied, as far as they are applicable, to radiotelegraphy. For this reason we present here a translation of the Chinese general regulations affecting all electrical means of communication, with a few comments emphasizing the points which appear to affect wire wireless telegraphy, and also form of licence for pilot boats.

A—Instructional Order No. 20.

B—Form of Licence for Pilot Boats.

INSTRUCTIONAL ORDER No. 20.

A Dated April 18th, in the fourth year of the Republic of China—*i.e.*, 1915.
REGULATIONS AFFECTING ELECTRICAL MEANS OF COMMUNICATION.

ART. 1.—All telegraphs and telephones, whether wired or wireless, shall be included in the term "Electrical means of Communication."

ART. 2.—All electrical means of communication shall be owned and controlled by the State.

ART. 3.—The following electrical means of communication may be set up by private individuals or corporations after the sanction of the Government has been obtained:

(a) Those established for the exclusive use of railways, mines, or other specific and commercial enterprises.

(b) Those which are set up by individuals or corporations or official departments on their premises for the purpose of establishing connection with a public telegraph office for the convenience of the transaction of the business carried on by the said individuals or corporations.

(c) Those which are used by individuals, corporations, or official departments for intercommunication between various parts of the building in which they are located.

(d) Those which are used by ships *in transitu*.

(e) Those which are set up for the purpose of experiment or research.

(f) Telephones whose calling powers are to be confined within a certain definite area. These must not, however, be erected in any area which is at present furnished with telephonic communication.

[This clause appears to be one intended to apply to future telephone installations and not to any which may be at present erected. Of the above items it will be noted only (d) and (e) can apply to wireless telegraphy.]

ART. 4.—The Government, in case of necessity, may, in accordance with the provision of Laws and Edicts, seize all private electrical means of communication and convert them to public or military use. When, under the provision of this regulation, the Government so seize and make use of privately owned electrical means of communication, it may appoint officials to take charge of and work them.

ART. 5.—When the Government consider it necessary in the interests and for the maintenance of public safety, they can restrict, suspend or cancel any use of electrical means of communication within certain prescribed areas.

ART. 6.—The Superintendent officials at telegraph offices controlled by the Government may suspend the transmission of any message

or refuse altogether to accept it, when they consider its contents to be opposed to public safety.

ART. 7.—When special circumstances or *force majeure* cause telegrams to be delayed in transmissions or prevent their transmission, the senders cannot claim compensation for damage arising from such delay or hindrance.

ART. 8.—Correspondents are themselves responsible for the contents of their messages.

ART. 9.—With regard to the transmission of telegrams or telephone messages no exemption with regard to liability or responsibility can be entertained on the ground of mental deficiency on the part of the sender.

ART. 10.—Telegrams received at public telegraph offices—other than those specified by Government orders—will be delivered in accordance with the addresses given by the sender. If, owing to the fact that the address given is incorrect or insufficient, the telegram cannot be delivered, this fact will be publicly announced, and if no application for the message is received within forty-two days from the date of the public announcement, the said message will be destroyed.

ART. 11.—When messages are received in secret code, or in obscure or metaphorical language, the telegraph officials may, if they think fit, call upon the sender to translate the code or elucidate the meaning of the message. If the sender refuses to decode or explain, or, in complying with this request, fail to put the telegraph official truthfully in possession of the real meaning of the message, the official may stop the transmission of the said message.

ART. 12.—Officials, workmen, or messengers engaged in the performance of their duty in connection with telegraphs or telephones are not to be interfered with or stopped by the authorities of the customs or by those operating the canal locks.

ART. 13.—Officials, workmen, or messengers when proceeding in discharge of their official functions are to be allowed unhindered transit over building land and fields (with the exception of those enclosed by walls and gateways) whenever there may be any hindrance to their transit through the regular streets or paths. But if the passage of such officials, workmen, or messengers causes damage to be done to buildings, or to crops in cultivated property, the Government will pay adequate compensation on the application of the owner and on his proof of such damage.

ART. 14.—When officials, workmen or messengers engaged in performing their official functions ask for help or assistance in order to overcome any special hindrance in transit, or when they ask for assistance in climbing mountains, or crossing rivers, the persons to whom such request is made may not refuse such help or assistance without assigning adequate reason for so doing. But in the event

of such assistance being tendered, the Government will give the person rendering it fit and proper remuneration for such aid and assistance on his application for such remuneration.

ART. 15.—Telegraph or telephone wires may be set up at convenient places, no matter through what property it is necessary for them to pass; but if their erection involves an encroachment on the rights of others, whether private individuals or corporations, the Government will on application allot adequate compensation for such encroachment.

ART. 16.—Charges for telegrams and telephone messages shall be collected in cash according to fixed rates.

ART. 17.—Materials used for the purposes of Telegraph and Telephone Services shall be exempted from tax, but not from customs Duties.

ART. 18.—With reference to the compensation for damages caused, and the right of application for remuneration referred to in the above clauses in connection with the carrying out of Electrical Means of Communications, the period within which such right to compensation or remuneration may be dealt with, and the manner in which it may be so dealt with and adjudicated, shall be regulated by separate "Instructional Orders."

ART. 19.—Any who may offend against Articles 2, 3, 4, 12, 13, and 14, shall be liable to a fine of from 5 to 200 dollars. Those who offend against Articles 2 and 3 shall, in addition to fines, be liable to confiscation of poles, wires, machines or other apparatus.

ART. 20.—The conditions laid down in Articles 12-19 shall not be applicable to private electrical means of communication, but the specially authorised telephones erected under section (f) or Article 3 may adopt the regulation comprised in Article 16.

ART. 21.—All Laws, Orders or Treaties affecting telegrams between China and Foreign Countries shall have their respective provisions observed and the provisions of this Instructional Order shall not be held to modify or abrogate them.

ART. 22.—These regulations shall come into force immediately on the date of their promulgation.

FORM OF LICENCE FOR PILOT BOATS IN CHINESE WATERS.

B The (hereinafter called "the licensee") is hereby granted licence to operate within the pilot district of the wireless telegraph system installed on board the Pilot Boat, as specified in the schedule hereto for the period commencing the and terminating on the, on payment of the sum of ten Mexican dollars, being the licence fee for the privilege above named.

This licence is subject to the following terms, conditions and restrictions:—

1. The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

2. The range of signalling shall at no time exceed one hundred nautical miles.

3. The licensee shall use the licensed apparatus solely for the purpose of exchanging with ships at sea messages relating to the safe and prompt working of the licensee's pilot service, and for making or answering calls of distress. However messages originating or

terminating on board the aforesaid pilot boat may be exchanged with the Chinese wireless coast stations at on payment of the ordinary charges accruing to the Chinese Telegraph Administration for wireless messages exchanged by means of the said stations. Payment of such charges shall be made in such manner as the Ministry of Communications shall direct.

4. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the transmission or receipt of messages, except messages authorised under paragraph three.

5. All telegrams exchanged by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose. Such registers as well as the licensed apparatus shall be open to inspection by thereto authorised officers of the Chinese Telegraph Administration.

6. The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Ministry of Communications.

7. The licensee shall observe the provisions of the International Radiotelegraphic Service Regulations of 1912, as regards transmission of messages (Article XX—Article XXXIV) in so far as they are not inconsistent with the rights and privileges granted by these presents.

8. The licensee shall so operate the licensed apparatus as not to interfere with:—

(a) Naval signalling by means of any system of wireless telegraphy between two or more ships of the Chinese Navy or between a ship of the Chinese Navy and any other wireless station, whether on shore or on any ship;

(b) The working of any wireless telegraph station lawfully established, installed, or worked in China or the territorial waters thereof, and in particular the licensed apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations on ships at sea.

9. The licensee shall not work or use the licensed apparatus whilst the boat is in the harbour of, except with the special permission in writing of the Ministry of Communications.

10. Regulations 8 and 9 shall, however, not apply to the use of the licensed apparatus for the purpose of making or answering signals of distress.

11. The licensed apparatus shall not, without the consent in writing of the Ministry of Communications, be altered or modified in respect of any particulars mentioned in the schedule hereto.

12. The licensee, in case the aforesaid pilot boat be sold or dispensed with and remain in Chinese waters, shall remove the wireless apparatus before transfer of ownership takes place.

13. The licensee shall operate the licensed apparatus only during the hours indicated on the schedule hereto, except for the purpose of making or answering signals of distress.

14. The licensee shall at all times indemnify the Ministry of Communications against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

15. If, and whenever, in the opinion of the Ministry of Communications, the interests of the Government of China demand that the

use of the licensed apparatus shall be prohibited or shall be under full control of the said Government, the licensee shall conform to all directions prescribed by the Ministry of Communications.

16. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, the licensee shall be liable for every such breach, non-observance or non-performance to a penalty of one hundred Mexican dollars, and in every such case the Ministry of Communications may, by writing, revoke and determine these presents, and the licence herein granted shall become null and void.

17. This licence or a confirmed duplicate of it shall always be carried on board the aforesaid Pilot Boat.

The Schedule of Ship Stations before referred to :—

1. Name of ship on which station established.
2. Nationality.
3. Call signal.
4. Normal range of signalling in nautical miles :—
 - (a) by day ;
 - (b) by night.
5. Character apparatus :—
 - (a) Radiotelegraph system with the characteristics of the system of emission ;
 - (b) Wavelengths in metres (the normal wavelength to be underlined).
6. Hours of service.
7. Power :—
 - (a) Source and maximum output.
 - (b) Maximum antenna energy.
8. Alternator :—
 - Number of cycles per second.

COLOMBIA

(See Maps 48 and 50).

CONTROL.

CONTROL of radiotelegraphy in the Republic of Colombia is vested in the Minister of the Interior, who is ultimately responsible, whilst the executive authority is wielded by the Director of Posts and Telegraphs.

ADMINISTRATION.

No special regulations have been issued through the medium of wireless legislation, but in accordance with the current Colombian laws wireless as well as wired telegraphy constitutes a public Service under State control in every way. The Government does, however, grant permission for contracts, under which radiotelegraphic service may be instituted by private companies. The United Fruit Company owns and works the station of Santa Marta, which was put into operation in 1912, and the Telefunken Company owns and works the station of Cartagena. Marconi's Wireless Telegraph Co. own and work the station of Puerto Colombia and have under construction an international station at Bogota. The station of San Andres, which is owned by the Government, was constructed by the Telefunken Co., but later refitted by Marconi's Wireless Telegraph Co., by whom it is operated on behalf of the Government.

The Government of Colombia have contracted with Marconi's Wireless Telegraph Co. for the erection of five new stations, four of which will be completed almost immediately. These will be managed and administered by the company by virtue of an arrangement with the Colombian Government.

In March, 1922, the Government of Colombia appointed a Commission to formulate Laws and Regulations which are to be submitted to the House for discussion and enactment.

COSTA RICA

(See Maps 44 and 47.)

CONTROL AND ORGANISATION.

THE control of wireless telegraphy and telephony is a State monopoly. The only station in regular service is at Port Limon ; this is owned and operated by the United Fruit Co. for the requirements of their business and for general public service.

The Government have a small station on the Nicaraguan frontier, but this only works spasmodically, and is at present in disrepair.

Two larger stations are in course of erection in Costa Rica, the first of which is expected to be open for public service in March, 1924.

ADMINISTRATION.

Wireless telegraphy is the subject of Laws and Regulations, of which we have only been able to obtain the following:—

A—Decree 34 of 10th April, 1920.

B—Decree 25 of June, 1922.

C—Decree 20 of 3rd August, 1921.

A WITH REGARD TO THE RADIOTELEGRAPHIC STATIONS IN COSTA RICA.
No. 34.

FRANCISCO AGUILAR BARQUERO

Provisional President of the Republic of Costa Rica.

DECREES.

ART. 1.—The wireless telegraph and telephone, which are services of public utility, are declared to be the monopolies of the State. The concession and rights for their exploitation can only be obtained for a limited period and by means of a contract which necessitates the approval of the legislative authority for its validity.

ART. 2.—There can be no question of concession regarding the right, which the State reserves to itself in perpetuity, to establish radiographic stations in the territory of the Republic for military purposes, and for the transmission and reception of official messages.

ART. 3.—The executive authority, in accordance with the regulations which it prescribes, shall be able to authorise the amateurs and the institutions for instruction to install radiographic apparatus for experimental purposes, it being always understood that they should not violate the secrets of the correspondence of the wireless communications, disturb their working, nor use their apparatus for commercial purposes.

ART. 4.—The foundation, handling and exploitation of the wireless telegraphy and telephone establishments for international service can only be permitted to natives of Costa Rica, singly or in co-operation, under the superintendence and protection of the State. The concession thus obtained, and the establishment and the capital which arise from it, shall be unattachable, and shall not be able to be violated in any case, nor for any reason, without the previous consent of the Constitutional Congress.

ART. 5.—The permission conceded for such wireless stations as are already established in the country can be revoked at any time, and their respective plants pass to power of the State against the corresponding indemnity.

Given at this presidential house, San José, on the Tenth day of the month of April, of One thousand nine hundred and twenty.

FRANCISCO AGUILAR BARQUERO.

The Secretary of State for Foreign Affairs and Offices appertaining thereto.

ANDRES VENEGAS.

The Secretary of State for the Interior and the Police.

CARLOS M. JIMENEZ.

The Secretary of State for the Treasury and Commerce.

CARLOS BRENES.

The Secretary of State for Public Works, etc.

P. PEREZ ZELEDON.

The Secretary of State for Public Instruction.

J. GARCIA MONGE.

The Secretary of State for War and the Navy

AQUILES BONILLA G.

OFFICIAL SECTION.

LEGISLATIVE BODY.

DECREE No. 25.

B THE CONSTITUTIONAL CONGRESS OF THE REPUBLIC OF COSTA RICA.
ORDERS.

ART. 1.—That authorisation be given to Messrs. Ricardo Pacheco and José Joaquín Carranza, engineers, to form a limited liability company, which shall be called *Compañía Radiográfica Internacional de Costa Rica*, which will exploit the concession granted to them by Order No. 47 of the 25th of July, 1921, and will assume all the obligations of the concessionaries.

ART. 2.—The company, which is formed with this object, will be by registered shares, which can only be subscribed for and transferred by and to subjects of Costa Rica, who must be subject to all laws and regulations as per order No. 34 of the 10th of April, 1920.

Communicated to the executive body.

Given in the Sessions Hall of the Congress—National Palace—San José, on the 23rd day of the month of June, of the year 1922.

ARTURO VOLIO, President.

JORGE ORTIZ E., First Secretary.

NAUTILIO ACOSTA, Under Secretary.

President's House, San José, on the 24th day of the month of June, of the year 1922.

Executed, Julio Acosta, Secretary of State for Public Works.

NARCISO BLANCO.

DECREE No. 20.

JULIO ACOSTA GARCIA,

Constitutional President of the Republic of Costa Rica.

ORDERS

C The following regulations for wireless installations.

ART. 1.—Radiotelegraphic and radiotelephonic stations belonging to amateurs and instruction institutes may only work when they have obtained a written permit from the Minister of the Interior, which may be cancelled whenever it is deemed necessary. Said stations will not use a longer transmission wave than 200 metres, nor a transformer which exceeds 1 kilowatt, and cannot use a valve of more than 5 watts except by special authorisation of the legislative body, according to Decree No. 34 above quoted.

ART. 2.—If in the above-mentioned stations the transmitter is of such a nature that it radiates power in two or more wavelengths, more or less defined in accordance with a sensitive wave, the power of the shorter waves must not exceed the power of the longer by more than 10 per cent.

ART. 3.—The logarithmic decrement by complete oscillation in the series of oscillations emitted by the transmitter of the stations referred to, shall not exceed two-tenths.

ART. 4.—No person or persons holding stations or cognisant of the handling of such, before mentioned, shall divulge or make public the contents of any message whatsoever they may receive. All such as are deemed culpable of

divulging or making public any message shall be fined the sum of 250 colons or be imprisoned for three months, or both if it should be so decided. In case of this offence occurring, he who is guilty of it shall be exposed to the cancellation of the licence conceded, and to the confiscation of all the apparatus in use at the station. There will be, moreover, in such punishment as is incurred by those who violate the correspondence, everything in accordance with the laws of the country.

ART. 5.—All station apparatus described in Art. No. 1 of this order shall be sealed by the Inspector of Communications, and if at any of his visits to said stations he should find any seal broken or replaced, he shall expose the

guilty party to confiscation of his installation and apparatus and the cancellation of his licence.

ART. 6.—The official establishments for tuition, once their licence obtained, may make such experiments as will serve for tuitlional purposes, always refraining from disturbing or causing interference to the international office or to others which are authorised by the Government.

Given in the House of the President on this the 3rd day of August, One thousand nine hundred and twenty-one.

JULIO ACOSTA.

The Secretary of State for the Interior.

EQUILES ACOSTA.

CUBA

(See Maps 35, 39, 40, 44, 45 and 46).

CUBA was in Spanish occupation until the signature of the Paris Treaty, in December, 1898, when it assumed independence, and is under the government of a President.

CONTROL.

The radiotelegraph service in Cuba is controlled by the Government and is carried on under the direction of the Department of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Sr. Mignel Paniagua	Director-General of the Department of Communications	Havana
Sr. Carlos Barnet	Sub-Director of the Department of Communications	Havana
Sr. Pedro Pablo Torres	Chief of the Division of Technical Inspection	Havana

ORGANISATION.

The radiotelegraph service of Cuba was inaugurated in the year 1906 by the establishment of two small stations installed at the landing places of Mariel and Nueva Gerona, on the Island of Pinos, for the handling of internal correspondence.

In 1909 the station of Mariel was abolished and the service extended by the installation of four new stations distributed amongst the ports of Havana, Santiago de Cuba, and the towns of Santa Clara and Camaguey. The four stations were instituted for public service, and filled a great want in view of the large number of vessels navigating the territorial waters of the Island.

The stations of Santiago de Cuba and Camaguey were subsequently removed to the coast towns of Chaparra and Baracoa, and a new station established in the town of Pinar del Rio.

At present eight coast stations exist, all of which are open for public correspondence with ships.

In addition to the coast stations the Cuban Government has under its jurisdiction over twenty ship stations installed on vessels of the Navy and merchant vessels belonging to private companies.

ADMINISTRATION.

The Cuban Administration adhered to the Radiotelegraph Convention of London in January, 1918; but owing to reasons that are irrelevant here, this adherence was not formalised until February, 1920. For this reason the administrative side of the radiotelegraph service is actually in process of organisation and the laws and regulations by which it will be governed are being studied.

CYPRUS

(See Maps 3 and 21)

THE government of the island is administered by a High Commissioner (appointed by Great Britain) with the advice and consent of the Legislative Council.

CONTROL.

There are at present no wireless stations on the island and consequently no organisation is in existence.

ADMINISTRATION.

The following Act provides for the regulation of wireless telegraphy in Cyprus:—

A—Wireless Telegraphy Law, 1913.

B—A Law to make further Provision with respect to Wireless Telegraphy on Ships.

A Law enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to provide for the Regulations of Wireless Telegraphy.

A Be it enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Law may be cited as the Wireless Telegraphy Law, 1913.

2. In this Law:—

“Wireless telegraphy” means any system of transmitting messages or other communications by means of electric galvanic or magnetic signals without the aid of any wire connecting the points from and at which the messages or other communications are sent and received, and includes any apparatus for transmitting or receiving such messages or other communications.

Provided that nothing in this Law shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The High Commissioner in Council may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus except under and in accordance with a licence granted in that behalf by the High Commissioner.

(2) Every such licence shall be in such form and for such period as the High Commissioner in Council may determine and shall contain such terms conditions and restrictions on and subject to which the licence is granted as the High Commissioner in Council shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence but no

proceedings shall be taken against any person under this Law except with the previous sanction of the King's advocate.

(2) If a judge of a District Court or of the Supreme Court is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant authorising the person to whom it is addressed to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The High Commissioner in Council may make regulations for all or any of the following matters:—

(a) for prescribing the form and manner in which applications for licences under this Law are to be made;

(b) for prescribing the fees payable on the grant of any licence;

(c) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship of any nationality in the waters of Cyprus shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established installed or worked in Cyprus or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) for prohibiting except with the special or general permission of the Island Postmaster the working or using of any apparatus for wireless telegraphy on board a merchant ship of any nationality whilst such ship is in any of the harbours of Cyprus;

(e) for prohibiting or regulating in case at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships of any nationality in the waters of Cyprus the use of wireless telegraphy on board such ships while in such waters by such further rules as the High Commissioner may see fit to make from

time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (c), (d) and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the High Commissioner in Council that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms conditions and restrictions as the High Commissioner in Council may think proper but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Law or of any Regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Law and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine not exceeding fifty pounds.

(2) All convictions forfeitures and fines under this Law or any Regulations made thereunder may be had and recovered before a District Court.

9. This Law shall come into operation on the 1st day of July, 1913.

Passed in Council the twenty-third day of May, in the year of Our Lord one thousand nine hundred and thirteen.

No. XII, 1922.

A Law enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to make further provision with respect to Wireless Telegraphy on Ships.

MALCOLM STEVENSON.

March 15th, 1922.

Be it enacted by His Excellency the High Commissioner and Commander-in-Chief of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

SHORT TITLE.

1. This law may be cited as the Merchant Shipping (Wireless Telegraphy) Law, 1922, and shall be construed as one with the Merchant Shipping Acts, 1894 to 1916, so far as the same shall be applicable or shall be made applicable to Cyprus.

INTERPRETATION.

2. For the purpose of this Law:—

"Passenger steamer" means a steamer which carries more than twelve passengers.

"Wireless telegraphy inspector" means an officer appointed by the High Commissioner under the provisions of this Law.

WIRELESS TELEGRAPHY INSPECTORS.

3. The High Commissioner may appoint officers as wireless telegraphy inspectors, who shall have the same duties and powers as if they had been appointed wireless telegraphy inspectors under the Merchant Shipping (Convention) Act, 1914.

WIRELESS TELEGRAPHY REQUIREMENTS.

4. (1) Every seagoing British ship registered in Cyprus being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless telegraph installation and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this

Law, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules;

Provided that the High Commissioner in Council may exempt from the obligations imposed by this Law any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The High Commissioner in Council shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number grade and qualifications of operators and watchers to be carried;

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Law, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the High Commissioner in Council to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Law.

5. The obligations imposed by this Law shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by or under the wireless Telegraphy Act, 1904, the Merchant Shipping (Convention) Act, 1914, as applicable to Cyprus, or the Wireless Telegraphy Law, 1913.

APPLICATION TO SHIPS NOT REGISTERED IN CYPRUS.

5. The foregoing provisions of this Law shall, as from a date three months after the coming into operation of the obligations imposed by this Law on British ships registered in Cyprus, apply to ships other than British ships registered in Cyprus while they are within any port in Cyprus in like manner as they apply to British ships so registered.

DATE OF COMING INTO OPERATION.

6. This Law shall come into operation on a date to be fixed by the High Commissioner by notice in the *Cyprus Gazette*.

Passed in Council the thirteenth day of March, in the year of Our Lord one thousand nine hundred and twenty-two.

THALES CABABE,

Clerk of Council.

This Law came into operation on August 1st 1923.

CZECHOSLOVAKIA

— (See Maps Nos. 8 and 14.) —

THE Czechoslovak Republic is the old Kingdom of Bohemia, with some additional provinces.

CONTROL.

The control of the organisation and administration of wireless telegraphy and telephony is in the hands of the Ministry of Posts and Telegraphs.

ORGANISATION.

The new 100 kW. station at Podebrady, near Prague, is nearing completion, meanwhile the 5 kW. station already installed there communicates with other European stations and transmits meteorological reports, news bulletins, etc. There are smaller transmitting stations at Karlovy Vary and Brno for official messages, and three in the aerodrome at Kbely, near Prague, used mainly for aviation purposes. The station at Kral Vinohrady also transmits exchange and press reports. Receiving stations have been installed at Moravska Ostrava, Marianske Lazne, Karlovy Vary, Bratislava and Kosice. 5 kW. transmitting stations are in the course of erection at Bratislava and Kosice. Podebrady and Kbely are also used for telephonic transmissions, and concerts are broadcast daily from these stations.

ADMINISTRATION.

The regulations affecting radiotelegraphy and radiotelephony are contained in the Act of March 23rd, 1923 (No. 60 of the Czechoslovakian Laws and Regulations), and embody the following principles:—

The erection, maintenance and operation of all wireless stations, both transmitting and receiving, and including those on airships and aeroplanes, is a State monopoly.

The Military Administration may establish and maintain wireless stations by agreement with the Ministry of Posts and Telegraphs, but only for the purpose of training Army operators.

The Ministry of Posts and Telegraphs may grant licences for the erection and use of private wireless stations. A Government decree is being prepared containing detailed provision for the granting of such licences. Licences for private transmitting stations will be very restricted, and secrecy of communications stringently protected.

A Government permit is required for the manufacture, sale or possession of wireless apparatus in Czechoslovakia as well as for its importation. This permit is issued by the Ministry of Commerce in conjunction with the Ministry of Posts and Telegraphs.

The wireless stations controlled by the Ministry of Posts and Telegraphs are regarded as forming a part of the general telegraph system and are subject to the same regulations.

The strictest secrecy regarding telegraphic messages must be observed both by employees in the telegraph service and by licensees of private stations. A breach of this regulation is punishable by imprisonment.

It is also a punishable offence to install a wireless transmitting or receiving station without licence, or to sell, keep or import wireless apparatus without a Government permit. In times of war or disturbance these offences will be severely punished. At such times also the State may take possession of licensed wireless stations and indemnify the licensees.

In accordance with the Law of January 27th, 1922 (Section 10), relating to the use of communications and of real-estate for the purposes of telegraphy and in accordance with the provisions of the Government decree of February 1st, 1923, the Telegraph Administration is authorised, upon payment of compensation, to take over private property for the purpose of erecting a wireless station.

Amateur radiotelegraphy is subject to the above Telegraph Act and will be further regulated by the projected Law concerning the manufacture, sale, possession and importation of wireless apparatus. Consequently it is essential that every amateur manufacturer and experimenter must hold a Government permit or licence. The same rules apply to companies manufacturing or selling wireless apparatus and those engaged in radiotelegraphy and telephony.

DANZIG (Free Town of).

(See Maps 3, 8 and 9)

CONTROL.

THE wireless telegraph service is controlled by The Administration of Posts and Telegraphs for the Free Town of Danzig, and is under the direction of the Danzig Telegraph Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Councillor Zander ..	Director of Post and Telegraph Administration ..	Danzig
Herr Bodin	Chief Postmaster	Danzig

PRINCIPAL STATIONS COMPLETED OR UNDER CONSTRUCTION.

Danzig (coast station) KAZ. $2\frac{1}{2}$ kW spark. Wavelengths : 300, 450, 600, 800, and 1,800 metres.

Danzig 1 kW. c.w. for communication with Libau, Riga and Berlin. Wavelengths : 800-2,500 metres.

Amateur stations are not encouraged and it is believed that they will be entirely suppressed during the coming year. There are 23 receiving stations (telephony) in the Banks for collecting Stock Exchange reports which are broadcast from Berlin.

Weather reports and storm signals are transmitted for the coastguards in Hamburg and the air traffic between Königsberg, Danzig and Berlin.

ADMINISTRATION.

For wireless traffic the following rules and regulations, etc., are in force :—

The International Wireless Telegraphy Agreement.

The Law relating to Telegraphy in the German State, of April 6th, 1892.

The German Law of March 7th, 1908, concerning the alteration of the law relating to Telegraphy in Germany, of April 6th, 1892.

The German regulations concerning the working of telegraph installations on foreign ships on the German high seas, of December 12th, 1909.

The direction for wireless telegraphy service for Germany, of June 15th.

The German telegraph regulation of June 16th, 1904.

DENMARK

(See Maps 8, 9, and 15)

Including Farøe Islands.

THE territory is ruled by King Christian X, assisted by the Cabinet consisting of twelve Secretaries of State, whose power rests upon the possession of a majority in the Lower House (Folketinget).

CONTROL.

Wireless telegraphy is a Government monopoly, and the administration is supervised by the Minister of Public Works.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY AND TELEPHONY.

<i>Officials.</i>	<i>Title.</i>	<i>Address.</i>
Mr. M. Slebsager	Minister of Public Works	Copenhagen.
Mr. T. F. Krarup ..	Director-General of Telegraphs	Do.
Mr. W. Gordon-Thomsen	Engineer-in-Chief of the Telegraph Department, Inspector of Wireless Installations	Do.
Mr. M. Gredsted ..	Chief Secretary, Chief of Wireless Instruction	
Mr. P. Moller	Traffic Inspector of Wireless Telegraphy and Telephony	Do.
Mr. A. Poulsen	Electrical Engineer, Inspector of Wireless Installations and Instruction	Do.

ORGANISATION.

The commercial use of radiotelegraphy is organised under the supervision of the Telegraph Department and the State Railway Department (both acting under the jurisdiction of the Department of Public Works); the Naval Department and the Lighthouse Department and the War Office. The various departments exercise jurisdiction independently respecting their own radiotelegraphic section.

The latest available statistics enumerate:—

LAND STATIONS.

- (a) Seventeen directly controlled by Government (two of them situated in the Farøe Islands).
- (b) One station for Government traffic only.
- (c) Five instructional stations.

SHIP STATIONS.

- (a) Two hundred and eighty-six, low-power.
- (b) Seventy-five Government vessels.
- (c) Two hundred and eleven private vessels.

The Danish Government contemplates the erection of a high power station for transatlantic service.

There are no arrangements for the transmission of time signals, but the Lyngby Radio station broadcasts a press message at 1100 G.M.T., and meteorological reports at 0735, 1335 and 1835 G.M.T.

No forms of licence for radiotelegraphic working have been issued. The regulations for the erection and operation of private wireless stations are under revision, but it is not yet possible to give details. Acts regarding wireless in its application to aviation are also projected, but so far have not eventuated.

Radiotelephonic communication between the Island of Bornholm and the rest of Denmark was established on May 11th, 1923.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in Denmark was passed in 1907 (Act No. 99 of April 19th). New regulations became effective on July 1st, 1913. Both are reprinted below.

A—Act 99 of 1907.

B—Rules dated July, 1913.

C—Act No. 166 of May 1st, 1923.

D—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams. (See under Norway (F))

A The regulations affecting Wireless Telephony in Denmark are based upon:

ACT No. 99 OF APRIL 19TH, 1907.

1. The Government shall have the sole right to erect and operate wireless telegraphs (radiotelegraphs) within the Danish boundaries and maritime territory.

2. Telegraph stations on board ships under foreign flag must only be utilised on Danish maritime territory when following the regulations to be drawn up in this respect by the Minister for Public Works. The Minister may prohibit every kind of telegraphic communication from such stations and take the necessary measures to carry through such prohibition, when in his opinion circumstances require it.

3. On board ships under Danish flag, not owned by the Government, telegraphic stations must only be fitted and operated both on and outside Danish maritime territory according to licence previously obtained from the Minister of Public Works. In case the conditions concerning the fitting and working of the station stipulated in the licence are not maintained, the Minister may cancel the licence.

In case it is desired that the working of stations being in operation at the time when the Act comes into force, should be continued, an application to that effect must be filed with the Minister for Public Works not later than four weeks after the Act has come into force, the Minister having then to decide whether and on what conditions the operation of the station may be continued.

4. Scientific and technical trials with wireless telegraphy must be made by no others than the State Authorities unless permission to that effect has been previously obtained from the Minister for Public Works.

5. The regulations stipulated in Act No. 84 of May 11th, 1897, Art. 17, concerning the duty as to secrecy incumbent on the officers and functionaries of the Telegraph Department and concerning the punishment they may be subjected to in the case of a breach of the aforesaid duty, should also be applicable to wireless operators. The regulations stipulated in Art. 18 of the same Act concerning corresponding regulations for employers of private companies may also be made applicable towards operators on board ships.

6. Any contravention of the regulations given in Articles 1—4 shall be punished, provided that the circumstances concerned according to their nature do not inflict a more serious punishment, with forfeiture of the apparatus unlawfully placed and utilised. Furthermore, the contravening person may be liable to a fine of up to 400 kroner, which fine shall devolve to the Treasury. Such contraventions shall be dealt with in the same

way as public police cases. The Minister for Public Works shall be the only person entitled to institute proceedings against contraveners of this Act.

REGULATIONS.

B MADE EFFECTIVE ON JULY 1ST, 1913.

In accordance with Act No. 99 of April 19th, 1907, concerning wireless telegraphs (radiotelegraphs) and the International Convention concerning radiotelegraphs drawn up in London on July 5th, 1912, supplemented by appendix decisions, finishing protocol and service regulations, the following decisions shall be observed in founding and working of radiotelegraph stations and in the handling of radiotelegrams:

I.—ESTABLISHING OF RADIOTELEGRAPH STATIONS.

1. On Danish soil and on board ships permanently anchored, such as lightships, etc., radiotelegraph stations (coast stations) can only be established by the Government.

2. On board ships under Danish flag, not owned by the Government, radiotelegraph stations (ship stations) may only be established and operated after permission has been previously obtained from the Department of Public Works.

The licence or a certified duplicate of it must always be kept on board the ship.

The licence may be withdrawn if the conditions for the fitting and operation of the station set out therein are not complied with; in such cases the entire apparatus belonging to the station must be removed.

3. Applications for licences to establish and operate radiotelegraph stations on board ships sailing under the Danish flag must be drawn up on forms approved of by the Department of Public Works, delivered and sent in duplicate to the Telegraph Department, and must be supplied with an endorsement to the effect that the station will fulfil the following conditions:

(a) The waves transmitted must be as pure and as little damped as possible; the utilisation of transmitting apparatus, by which the transmitted waves are generated by a direct sparking discharge in the antenna, especially, is only permissible in case of need. The latter arrangement of the transmitter may, however, be permitted in the case of certain special stations (as, for instance, on board small vessels), the primary energy of which does not exceed 50 watt.

(b) The speed of transmission and reception must be no less than twenty words a minute, the word to consist of five letters. New installations utilising an energy of more than 50 watt must be fitted in such a way as to make it easy to obtain more telegraph distances, smaller than the

normal ones, the smallest of which should be about 15 nautical miles (equal about 28 km.). Old installations utilising an energy of more than 50 watt must be altered, if possible, so as to comply with the regulations mentioned above.

(c) The receiving apparatus, protected in the best possible way against disturbances, must be able to receive signals with the wavelengths of up to 600 m., which are stipulated for the ship station.

(d) The primary energy of the station measured across the generator must under no circumstances exceed 1 kw.

(e) Larger energy than 1 kw. may, however, be utilised, if the ship is to interchange telegrams over a distance of more than 200 nautical miles (equal 370 km.) with the nearest station, or if communication, due to interference is not obtained unless by an increase of the transmitting energy.

(f) The station must be operated by one or more operators who have obtained certificates as specified below in Section 7.

The station must not be opened for communication until the telegraph department has issued a certificate, which will not be granted until the department, by inspection is satisfied that the conditions set out in the licence granted by the Department of Public Works have been fulfilled.

II.—INSTALLATION, SERVICE AND OPERATION OF PRIVATE SHIP STATIONS.

4. The apparatus of ship stations must at any time be in strict accordance with the conditions set out in the licence for their establishment.

5. The hours of service of each coast station are decided by the Government Department.

As far as the hours of service of ship stations are concerned, these stations are divided into the following three classes:

(1) Stations with continuous hours of service;

(2) Stations with limited hours of service; and

(3) Stations with no fixed hours of service.

During navigation stations with continuous hours of service must be attended to constantly at the aural apparatus. In the case of stations with limited hours of service the aural apparatus must be attended to during all of the hours of service as well as during the first ten minutes of each hour not comprised in the normal hours of service. Stations with no fixed hours of service are not obliged to keep any regular watch over the aural apparatus.

The classification of a ship as regards the hours of service of same shall be stated in the licence.

6. Any ship station must be fitted to utilise wavelengths of 600 m. and 300 m. respectively. The normal wavelength is 600 m. Small ships, may however, be allowed to utilise wavelengths of 300 m.; but they must always be able to receive telegrams with a wavelength of 600 m. During the hours of service each ship station must be capable of being called with its normal wavelengths.

Ship stations maintaining continuous watch and ship stations with limited hours of service shall be bound to have a radiotelegraphic spare installation, the single parts of which must be placed as safely as possible. This installation must have a source of energy of its own and must be capable of being put into use quickly, must be able to work satis-

factorily for at least six hours and must have a minimum range of:

80 nautical miles (equal to about 150 km.) for ship stations belonging to the first class (maintaining continuous watch).

50 nautical miles (equal to about 100 km.) for ship stations belonging to the second class (with limited hours of service).

This special installation is not required in the case of ships, the normal installations of which comply with the requirements of spare installations mentioned above.

7. The service of the ship station must be maintained by operators who are in possession of certificates granted by the Department of Public Works.

In cases of urgent necessity and during one voyage only the service of a ship station may be undertaken by one or more operators holding a certificate from a foreign Government which Government has joined the International Convention concerning radiotelegraphs.

The certificate shall certify:

Partly the ability of the operator:

(a) In the maintenance of the apparatus and knowledge of their working.

(b) In the sending and receiving (by sounding) of telegrams with a speed:

(1) No less than twenty words a minute for obtaining a certificate of first class, and

(2) No less than twelve words a minute for obtaining a certificate of second class.

(c) In the knowledge of the regulations utilised, governing radiotelegraphic service.

Partly that the operator shall be bound to secrecy and subject to penalty, etc., for a breach of this condition as in the case of State telegraph operators.

Operators holding a certificate of second class may do service:

(a) On board ships utilising radiotelegraph in their own service or for the correspondence of the crew only.

(b) As assistant operators on board all ships having at least one operator holding a certificate of first class.

Ship stations with continuous service must be operated by at least two operators holding a certificate of first class.

The radiotelegraphic service of the ship stations is placed direct under the master of the ship concerned.

In the event of a contravention of the regulations governing the operation of the radiotelegraphic service, the certificate may be cancelled by the Department of Public Works.

No unauthorised person must be allowed to enter the wireless cabin.

8. If technically possible, ship stations must interchange telegrams with other stations (coast or ship stations), without regard to the system of radiotelegraphy employed at the station concerned. The interchange of telegrams with other ship stations must, however, be so arranged that the working of coast stations is not interfered with, these as a rule having the priority in public telegraph service.

The operation of a station must as far as possible be arranged so that it does not interfere with other stations.

Exchange of superfluous signals and words is prohibited. Experiments and practice shall only be permitted in so far as the service of other stations is not interfered with; therefore, they must be executed with no other wavelengths than those utilised in the case of public telegram exchange, and utilising as little energy as possible.

When a ship is in a Danish harbour her station must only be utilised for communication with ships in distress.

9. According to the London Convention, the Telegraph Department must notify the Berne Bureau of the ship installation, and the Telegraph Department can demand to be furnished with any information regarding the installation, service, and working of a ship station, both for this and for other purposes.

10. The Telegraph Department will see that all conditions for the fitting and operation of ship stations are complied with. The inspectors for this purpose, who are selected by the Director of Telegraphs, must at any time on showing their authority be admitted to inspect and test the station, provided that the ship is within Danish waters. All information required by the said inspectors must be immediately given, and their directions must be complied with, pending the decision of the Director of Telegraphs, or, that of the Department of Public Works.

For the proper carrying out of the inspection each of the inspectors shall be paid 20 kroner for the inspection and a daily remuneration in addition to travelling expenses; such amount shall be paid by the Telegraph Department, but will have to be refunded (on demand) by the owners of the ship in question.

III—HANDLING OF RADIOTELEGRAMS.

11. Radiotelegraph stations open for public service for the transmission and reception of telegrams may be used by any person, unless the public telegram exchange at the station in question is limited to a certain special kind of telegrams (see section 14).

The telegrams are divided into three classes:

- (1) State telegrams.
- (2) Service telegrams.
- (3) Private telegrams.

The right to transmit State telegrams and service telegrams, and the right to priority for such messages, is at any time governed by the provisions embodied in the International Telegraph Regulation and the Inland telegraph Regulation governing the transmission of such telegrams over ordinary telegraph systems.

12. Regarding the radiotelegraph traffic, the handling of telegrams is governed by the International Radiotelegraph Service Regulation, Articles XIV-XV, XIX-XI, XLV-XLIX. The handling of telegrams to and from coast stations and over the ordinary telegraph and telephone system is at any time governed by the inland and International regulations for such traffic.

13. State and service telegrams may under all conditions be written in code or cipher. Private telegrams in code or cipher may be interchanged only with coast stations of such countries where this method of communication is allowed.

14. The ship station may be licensed for:

Ordinary public telegraph communication.

Limited public telegraph communication with specified ships, with specified shipping lines, etc.).

Private telegraph communication.

Special telegraph communication (exclusively for State use, etc.).

In the public telegraph communication the following special radiotelegrams are to be received and handled:

- (1) Radiotelegrams with prepaid reply.
- (2) Radiotelegrams (collated telegrams).
- (3) Radiotelegrams to be delivered by express messenger.
- (4) Radiotelegrams to be delivered by post.
- (5) Radiotelegrams with more addresses than one.
- (6) Radiotelegrams with certificate of arrival. Certificates of arrival are handled on lines of telegraphs only.
- (7) Paid service messages, except such as require a repetition or an information.
- (8) Express telegrams, which are, however, only transmitted as such on the ordinary lines of telegraphs and under the proviso that the prescriptions of the International Telegraph Regulations are followed.

All stations are bound to receive, answer, and, if possible, further to communicate messages from ships in distress and give these absolute priority.

Ship stations, however, have no responsibility whatever regarding the radiotelegraph communication.

Ship stations intended for public telegraph service shall get such printed forms, service journals, tariff lists, etc., as are necessary for this service, from the Telegraph Department against payment of fixed amounts. It is the duty of the station to take care that a sufficient supply of these things is always available. Such stations must furthermore be governed by all the instructions regarding the installation and operation of the station and the handling of the traffic issued by the Telegraph Department.

15. The abbreviations mentioned below covering the terms also mentioned below may be utilised; they are written between two double hyphens before the address, and are charged as one word:

To be delivered to addressee	
only	MP
Delivered open	Ouvert
Private express telegram	Urgent or D
x Addresses	TMx
Reply paid x	RPx
Urgent reply paid x	RPDx
Collation	TC
To be delivered per post	Poste
Télégraphie restant	TR
Poste restante	GP
Post registered	PR
Poste restante registered	GPR
Telegraphic certificate of arrival	PC
Telegraphic urgent certificate of arrival	PCD
Certificate of arrival by post	PCP
Express messenger	Express
All addressed to be stated	CTA

16. The entire charge for radiotelegrams shall include:

(1) Charge for the radiotelegraphic handling, namely:

(a) "Coast fee," which shall devolve on the coast station.

(b) "Ship fee," which shall devolve on the ship station.

(c) "Transit fee," for the coast or ship stations being intermediary stations at the handling of the telegrams.

(2) Charge for handling over the ordinary telegraph and telephone system paid according to the general regulations.

The coast fee for Danish coast stations shall be 40 ctm per word, minimum 4 fr.

The ship fee shall be fixed by the owner of the ship station, subject to the approval of the Department of Public Works. It must not exceed 40 ctm. per word; a minimum charge per telegram may, however, be adopted, not exceeding the charge for ten words. Service telegrams concerning telegrams handled exclusively per radiotelegraph are handled without any charge between the radiotelegraph stations, but are liable to charge when passing lines of telegraphs. Press telegrams at a reduced charge will not be received.

17. The entire charge for the handling of a radiotelegram from the sender to the addressee is to be collected from the sender by the station where it originates. The stations must not collect larger amounts than allowed in the tariffs.

18. All pecuniary liability in consequence of the operation of the ship station is payable entirely by the owners of the ship in question, without regard to whether the liability in any case may have been due to fault or neglect on the part of the operators.

19. The original radiotelegrams with the vouchers pertaining thereto must, if possible, be sent once a month by the ship stations to the Telegraph Department.

20. Reimbursements of charges paid, and accounts with the Telegraph Department, are governed by the International Radiotelegraph Service Regulations, Articles XLI and XLII.

IV.—OTHER REGULATIONS.

21. Stations on board ship under foreign flags must not be operated during the time such ships are in a Danish harbour, except to receive, answer and forward messages from ships in distress.

22. When the interests of the State require it, the Government may reserve to itself the right to prohibit all radiotelegraphic communication from ships, Danish or foreign, in Danish waters, and to make the necessary regulations to carry through such prohibition.

23. The maximum penalty payable to the State by the owners or radiotelegraphic company concerned for contravening the foregoing regulations is 400 kroner (§22), and all unlawfully fitted or utilised apparatus may be forfeited. Such contraventions are dealt with in the public police court, and proceedings may only be taken according to demand by the Minister for Public Works.

24. These regulations shall come into force on July 1st, 1913.

C The regulations affecting Wireless Telephony in Denmark are based upon:

ACT No. 166 OF MAY 1ST, 1923, stating:

1. The regulations relating to wireless telegraphy contained in Act No. 99 of April 19th, 1907, shall also apply to wireless telephony.

2. The Minister of Public Works may on terms set down by him grant licence to or monopoly for installing wireless receiving apparatus.

DOMINICAN REPUBLIC

(See Maps 35 and 45).

THE island of Santo Domingo is divided between two States, the Western being the Republic of Haiti, the Eastern the Dominican Republic. French is the official language of the former, Spanish of the latter. The constitution of the Dominican Republic in force at present bears the date of February 22nd, 1908. The President administers the Executive, the Legislative functions devolving on a National Congress with two Chambers, the Senate and Cámara de Diputados (House of Deputies). The United States landed troops in May, 1916, and is supervising the administration for the present.

CONTROL.

The supervision of the wireless service is under the control of the Sub-Dirección General of Posts and Telegraphs, who, in turn, is subordinate to the Director-General of Posts and Telegraphs, under the Department of "Fomento y Comunicaciones."

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Lieut.-Comdr. R. M. Warfield, C.E.C., U.S. Navy	Officer in Charge of the Department of "Fomento y Comunicaciones"	Government Palace, Santo Domingo City
Dr. Eduardo R. Soler, C.E. . .	Director-General of Posts and Tele- graphs	Senate Building, Santo Domingo City

ORGANISATION.

The first land wireless station was erected at the capital city of Santo Domingo in 1908. The apparatus did not work satisfactorily, a 2-kW. set was installed in September, 1913, and regular public communication was instituted with Puerto Rico. In addition to this publicly owned station,

there is a station at La Romana (in the Province of Seybo), owned by the (Sugar Refining) Central Guanica Company in Puerto Rico. The latter relays to the British Cable Company in Puerto Rico, and thus touch is maintained with the outside world.

In March, 1919, the two kilowatt set in the Radio Station of Santo Domingo was replaced by a new 5 kilowatt set.

Communication can now be made direct with San Juan, Puerto Rico, without the intervention of the Ensenada Station. It is also possible to have direct communication with Guantanamo, Cuba, especially at night, and with Port-au-Prince, Haiti.

There are no public aviation, meteorological or press services, but there is an extensive storm warning service. The United States air station sends a daily weather report to Washington.

ADMINISTRATION.

There are no special Laws and Regulations relating to wireless telegraphy and telephony.

A public contract is in force with the Central Guanica and Central Romana (Sugar Refining) Companies, dated December 19th, 1913. This lays down the conditions under which the two companies conduct for the Dominican Government Public Radiotelegraphic Service through the medium of their stations.

Clause I deals with the rates per word for foreign messages, which for the general public amounts to 30 cents per word.

Clause II deals with radio rates in the island—8 cents per word.

Clause III deals with special rates for officials of the States and the two companies, press rates, etc.

Clauses IV, V, and VI deal with matters and methods of accounting.

ECUADOR

(See maps 48, and 50.)

THE Republic of Ecuador is administered by a President, and the legislative power is controlled by a Congress of two Houses comprising thirty-two Senators and forty-eight Deputies respectively.

CONTROL AND ORGANISATION.

On the 1st March, 1920, the Government decreed the official monopoly of wireless communications in the territory of the Republic, and on the 17th April of the same year Ecuador adhered to the International Radiotelegraphic Convention of London, 1912.

The organisation and everything concerning wireless telegraphy and telephony is under the Direction of the Minister of the Interior, assisted by the Director-General of Telegraphs.

Officers and men in the Guayaquil artillery school are put through a comprehensive course in radiotelegraphy with the aid of laboratory apparatus.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Señor Don Guillermo Destruge	Director-General of Telegraphs	Quito
Dr. Francisco Ochoa Ortiz ..	Minister of the Interior	Quito

The first wireless telegraph station was installed in 1913 at Guayaquil by Señor Don Geo. Chambers Vivero, Captain of the Port, for the purpose of communicating with vessels navigating in the Guayaquil River. It has a range of about 80 miles. The Marconi Company has recently completed a station at Santa Elena Point having a range of over 500 miles.

There are at present three radiotelegraph stations, one at Quito, the capital of the Republic; and three coast stations, at Guayaquil, the principal port, Esmeraldas, and Puna Guayas.

The stations at Quito and Guayaquil are intended to ensure the more efficient communication between those two towns and to correspond with the station of Esmeraldas. The stations at Guayaquil, Esmeraldas and Puna Guayas also correspond with ships.

Communication is projected between the Galapagos Islands and the continent.

The stations of Quito and Guayaquil have been designed to maintain an efficient and permanent service, notwithstanding the difficulties of territory and atmosphere; these questions are of great importance in view of the geographical position of the country. As the traffic develops small stations will be established in towns of lesser importance.

The question of wireless telegraphy in Ecuador is receiving consideration from the technical and economical points of view and on March 28th, 1921, a contract was signed with the Compagnie Générale de T.S.F. for the installation of nine wireless stations, including one for inter-continental service.

EGYPT.

(See Maps 25, 27, and 29)

EGYPT was given independence in March, 1922, with Fuad I as King.

CONTROL.

Wireless Telegraphy forms a branch of the Ministry of Communications and is controlled by the State Telegraph Department of that Ministry.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Mr. G. F. Schreiber	Inspector-General of Telegraphs and Telephones.	Cairo.
Mr. W. J. Hilyer, B.Sc., M.I.E.E., A.M.I.C.E.	Chief Engineer of Telegraphs and Telephones.	Cairo.
Mr. H. E. Watterson	Wireless Engineer	Cairo.
Mr. L. G. Farthing	Wireless Superintendent	Ras el Tin, Alexandria.

ADMINISTRATION.

Wireless Telegraphy is a State monopoly in accordance with the Khedival Decree, dated May 12th, 1906; the Administration has now been transferred to the Ministry of Communications.

The Laws and Regulations governing Wireless in Egypt, are:—

A—Khedival Decree (Law No. 4, of 1906).

B—Authority for the use of Receiving Apparatus.

C—Licence for use of Receiving Apparatus.

KHEDIVAL DECREE, DATED MAY 12TH, 1906.

A 1. Wireless Telegraphy shall be a State monopoly, and no installation shall be established or used except by the Government or with the sanction of the Government.

2. The Minister of Public Works shall be responsible for the administration of this Law.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

B 1. Under the Khedival Decree, dated May 12th, 1906, Wireless Telegraphy in Egypt is a State monopoly, and the authority of the Minister of Communications is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR THE USE OF RECEIVING APPARATUS, CONDITIONS OF ISSUE, ETC.

2. Formal licences to conduct experiments in wireless telegraphy cannot at present be granted, but the Minister of Communications is prepared to authorise the use of wireless

apparatus for the reception of signals on the following conditions:—

3. The applicant shall produce evidence of nationality and two written references as to the applicant's character. Such references should be given by persons of standing who are not related to applicant.

4. There shall be no divulgence to any person other than properly authorised officials of the Egyptian Government or a competent judicial authority or any use whatever made of any message received by means of the apparatus.

5. The installation shall be subject to the approval of the Ministry of Communications.

6. The aerial wire shall not exceed the under-mentioned maximum height and dimensions:—

Extreme height of aerial above ground, 30 metres.

Total length of wire including leading-in wires: 30 metres for single wire aerial; 42 metres of wire where two or more wires are used (*e.g.*, total length 21 metres of double wire).

7. Valves shall not be used without the special authority of the Minister of Communications.

8. The apparatus shall be open to inspection at all reasonable times by properly authorised officials of the Egyptian Government.

9. An annual fee of P.T.50 shall be paid in respect of each experimental receiving licence to cover the expenses of the issue of the licence and the inspection of the station.

10. Authority to use wireless telegraph apparatus cannot be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian, who should proceed as indicated above and should state his (or her) relationship to the applicant. In such cases the evidence and references specified in condition (3) should be furnished BOTH AS REGARDS THE APPLICANT AND HIS PARENT OR GUARDIAN, and the latter will be personally responsible for the carrying out of the conditions of the licence.

11. The applicant should furnish (by letter addressed to the Egyptian State Telegraphs):—

(a) A formal acceptance of the conditions of this licence, copy of which will be delivered to him against receipt.

(b) Evidence and references described in (3).

(c) His full name, age, and particulars of his occupation.

(d) A remittance of P.T.50.

(e) A description of the apparatus which it is proposed to install, and if authority is desired for the use of valves, a diagram of the circuit in which they would be used.

(f) A sketch showing the form, height and dimensions of the proposed aerial wires (including leading-in wires).

(g) The address at which the apparatus would be installed.

12. This licence is temporary and is subject to cancellation by an order of the Minister in case of breach of any of the conditions above mentioned, or at the discretion of the Minister if he deems it necessary in the general interest.

Date

Signature of H.E. THE MINISTER.

Signature of the licensee.

(and his parent or guardian, if any).

EGYPTIAN STATE TELEGRAPHS.

LICENCE FOR WIRELESS TELEGRAPHY RECEIVING APPARATUS.

C Whereas by Law No. 4 of 1906, Wireless Telegraphy in Egypt was constituted a monopoly of the State and it is forbidden to set up or work apparatus for Wireless Telegraphy without the licence of the Egyptian Government;

This is to certify that..... of is authorised, until further notice only, to set up and work an experimental wireless apparatus for the sole purpose of the reception of signals at..... upon the following conditions:

1. The apparatus shall correspond exactly to the description and design as approved by the Inspector General of Telegraphs and annexed to this licence.

2. Valve receivers may not be used except by special permission accorded by the Inspector General of Telegraphs by approval given to the designs thereof annexed to this licence.

3. The aerial wires shall not be placed at a height exceeding 30 metres above the ground level at the site of the installation.

4. The total length of the aerials, including leading-in wires, shall not exceed:—

(a) 30 metres of wire where the aerial wire is single.

(b) 42 metres where two or more aerial wires are used.

5. No substantial alteration in the apparatus as authorised shall be made without the previous approval of the Inspector General of Telegraphs.

6. The apparatus shall be open to inspection at all reasonable hours by properly authorised officials of the Egyptian Government.

7. The Licensee shall pay to the Inspector-General of Telegraphs, on the issue of this licence, a fee of P.T. 50, and on the..... of every year thereafter a similar fee so long as this licence shall remain in force.

8. The licensee shall not divulge or cause or permit to be divulged to any person, other than an official of the Egyptian Government duly authorised in that respect or a judicial authority legally empowered to require such divulgence, any message received by means of the licensed apparatus, and he shall not make or cause or permit to be made any other use whatever of any such message.

9. This licence is subject to cancellation, at any time, by order of the Minister of Communications, in the event of the breach of any of the above conditions, or at the discretion of the said Minister if he shall deem such cancellation necessary in the public interest.

The licensee shall, in neither of such cases have any claim to indemnity or to the return of any fee paid or of any part thereof, and in case of breach of any of the conditions of the licence he shall be liable to pay a fine not exceeding L.E. 100 (one hundred), which will be imposed by the Minister.

Date

Minister of Communications.

ESTHONIA

(See MAPS 3 and 12.)

THE independence of the Republic of Esthonia was declared on February 24th, 1918. The republic was recognised "de jure" by the Supreme Council on January 26th, 1921, and admitted to the League of Nations on September 22nd, 1921, the legislative power being entrusted to the State Assembly, "Riigikogu." The executive authority rests with the head of the State, "Riigivanem," assisted by 10 Ministers.

CONTROL.

Except for military and naval stations, the control of wireless telegraphy and telephony is effected by the Director-General of Posts and Telegraphs, subordinated to the Minister of Ways and Communications.

ADMINISTRATION.

Except the International Radiotelegraphic Convention, 1912, ratified by Esthonia on March 7th, 1923, there are no laws or regulations concerning wireless telegraphy and telephony in Esthonia. No forms of licences have been issued up to the present time. A law relating to the use of wireless telegraphy and telephony on board vessels is in course of preparation embodying the following principles:—

SEC. 1. Wireless telegraph and telephone installations on board Esthonian as well as foreign ships are not to be used within the boundary district of Esthonian harbours. It is also forbidden for ships to use their wireless stations within 10 nautical miles from the Esthonian coast station, except (a) in case of accidents, and (b) if the ship station is calling the nearest Esthonian coast station.

SEC. 2. Installations on Esthonian ships can be used in Esthonian territorial waters with the permission of the General Post and Telegraph Office in agreement with the Marine Department, and subject to the general regulations issued by the General Post and Telegraph Office concerning the use of wireless telegraphy and telephony in Esthonia.

SEC. 3. In addition to the districts mentioned in Sec. 1, the General Post and Telegraph Office, by agreement with the Marine Department, can also prohibit the use of wireless telegraph and telephone installations on Esthonian and foreign ships in Esthonian inland waters, except in case of accident.

SEC. 4. As a rule the General Post and Telegraph Office is entitled to give prescriptions relating to radio-service to all Esthonian as well as foreign ships being in Esthonian home waters and provided with wireless telegraph and telephone installations, and to fix the terms of these prescriptions. The pilot-inspections, the Custom Houses and other interested administrations and their subordinate offices see to the execution of these prescriptions.

SEC. 5. Unless other regulations are passed regarding the use of radio installations on foreign ships in Esthonian home waters, such ships are allowed to use installations of their own, provided that the stipulations of the International Radiotelegraphic Convention be observed.

SEC. 6. In case of infraction or non-fulfilment of these rules and prescriptions issued by the General Post and Telegraph Office, if the consequences do not involve legal action, the Marine Department is competent to fix a fine from five thousand to thirty thousand marks according to a regulation laid down by mutual agreement between the Marine Department and the General Post and Telegraph Office.

FALKLAND ISLANDS

(See Maps 49, 52 and 53.)

THIS is a Crown Colony situated in the South Atlantic, 300 miles east of the Magellan Straits.

The Administration is conducted by the Governor, assisted by an Executive Council and a Legislative Council.

CONTROL.

Wireless telegraphy is under the supervision of the Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
M. Craigie-Halkett	Postmaster	Stanley
Mr. A. R. Lash	Engineer-Operator-in-charge ..	Stanley

ORGANISATION.

There are two wireless stations, one at Stanley Harbour, East Falkland, the other at Fox Bay, on the East Coast of the West Island. Both are owned by the Colonial Government and worked under the supervision of the Colonial Postmaster.

No licences are issued for radiotelegraphic working, and no aviation stations are in existence or projected.

ADMINISTRATION.

Radiotelegraphy is administered under the following Acts:—

A—Wireless Ordinance.

B—Wireless Telegraphy Regulations.

WIRELESS ORDINANCE.

DATED MARCH 15TH, 1912.

A The following Ordinance relating to wireless telegraphy came into force on March 15th, 1912:—

1. No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor in Council.

2. No person shall work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign), whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Council, and the Governor in Council may, by any such regulations, impose penalties, recoverable before a Stipendiary Magistrate or any two Justices of the Peace in a summary manner, for the breach of any such regulations, not exceeding twenty pounds for each offence, and may provide for the forfeiture of any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

3. If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding twenty pounds or to imprisonment not exceeding three months and, on conviction in the Supreme Court, to a fine not exceeding one hundred pounds, or to imprisonment for a term not exceeding twelve months; and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

4. If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a licence in that behalf or contrary to the provisions of the regulations made under this Ordinance, he may grant a search warrant to any constable or to any officer appointed in that behalf by the Governor and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy.

5. The expression "wireless telegraphy" means any communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Ordinance shall prevent any person from making or using

electrical apparatus for actuating machinery for for any purpose other than the transmission of messages.

6. The Wireless Telegraph Ordinance, 1903, is hereby repealed.

7. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1912.

WIRELESS TELEGRAPHY REGULATIONS.

B In pursuance of the powers in him vested by section 2 of the "Wireless Telegraphy Ordinance, 1912," His Excellency the Governor, by and with the advice of the Executive Council, is pleased to make the following Regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these Regulations shall on summary conviction before a stipendiary magistrate or any two justices of the peace be liable to a penalty not exceeding twenty pounds for each offence and to the forfeiture of any apparatus for wireless telegraphy installed on such ship and in default of payment to be imprisoned with or without hard labour for a period not exceeding three months.

6. These Regulations shall come into force on the first day of September, 1912.

Dated at Government House, Stanley, this 21st day of June, 1912.

By Command,

T. A. V. BEST,

Colonial Secretary.

FEDERATED MALAY STATES

(See Maps 17 and 22)

Including : Perak, Selangor, Negri Sembilan; and Pahang.

THE Federated Malay States are under British protection.

ADMINISTRATION.

Wireless telegraphy is regulated by:—

A—Enactment No. 7 of 1913, and

B—Rules under the above Enactment.

The text of both the enactment and the rules made under its provisions will be found below.

ENACTMENT NO. 7 OF 1913.

An Enactment to make better provision for the regulation of Wireless Telegraphy.

A

July 30th, 1913.

It is hereby enacted by the Rulers of the Federated Malay States in Council as follows:—

1. (1) This enactment may be cited as "The Wireless Telegraphy Enactment, 1913," and shall come into force upon the publication thereof in the *Gazette*.

(2) The Enactments specified in the schedule are amended by deleting from the interpretation of "Telegraph" in section 2 of each of the said Enactments the words "whether worked with or without lines of wires."

2. (1) In this Enactment the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraphs Enactments, 1905," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government of the Federated Malay States or of any of them or by subjects of any of the rulers of the said States or by bodies corporate established under and subject to the laws of the said States or of any of them and having their principal place of business within the said States or by any person residing within the said States.

(2) Nothing in this Enactment shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Chief Secretary to Government may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship except under and in accordance with a licence granted in that behalf by the Chief Secretary to Government.

(2) Every such licence shall be in such form and for such period as the Chief Secretary to Government may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Chief Secretary to Government shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Enactment except with the previous sanction of the Public Prosecutor.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in

any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Chief Secretary to Government may make rules for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under this Enactment are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, whilst such ship is in any of the harbours of the Federated Malay States.

(e) For prohibiting or regulating, in case at any time in the opinion of the Chief Secretary to Government an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, in the waters of the Federated Malay States, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Chief Secretary to Government may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) No rules made in respect of the matters described in paragraphs (c), (d) and (e) of sub-section (1) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Chief Secretary to Government that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Chief Secretary to Government may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Enactment or of any rule made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Enactment and for every such offence not

otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Enactment or any rules made thereunder may be had and recovered before the Court of a Magistrate of the First Class.

SCHEDULE.

State.	No. and year.	Short title.
Perak ..	6 of 1905	The Telegraphs Enactment, 1905
Selangor ..	9 "	" "
Negri Sembilan ..	7 "	" "
Pahang ..	8 "	" "

RULES.

UNDER "THE WIRELESS TELEGRAPHY ENACTMENT, 1913."

B In exercise of the powers vested in him by section 6 of "The Wireless Telegraphy Enactment, 1913," the Chief Secretary to Government has made the following rules:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked in such a way as not to interfere with (a) naval signalling or (b) the working of any

wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, shall be worked or used whilst such ship is in any of the harbours of the Federated Malay States, except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States.

3. If at any time, in the opinion of the Chief Secretary to Government, an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, while in the waters of the Federated Malay States shall be subject to such further rules as may be made by the Chief Secretary to Government from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Expressions defined in "The Wireless Telegraphy Enactment, 1913," have in these rules the meanings thereby assigned to them.

FIJI ISLANDS.

(See Maps 55 and 56)

THE administration is that of a British Crown Colony, the Governor being assisted by an Executive Council of six and a Legislative Council of twenty members.

CONTROL.

The four wireless telegraph stations in Fiji are owned and worked by the Colonial Government through the Department of Posts and Telegraphs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
H. P. St. Julian	Colonial Postmaster	Suva
W. G. Covell, A.M.I.E.E. ..	Telegraph Engineer and Officer in Charge Suva Radio.	Suva

Stations Suva radio, Labasa radio, Taviuni radio, and Savusavu radio. The colony possesses no wireless clubs or societies.

Weather reports are sent out daily.

There are no stations existing or projected for aviation or meteorological purposes.

ORGANISATION.

The first Wireless Telegraph Ordinance was passed in 1903. This was revoked by Ordinance No. XXV of 1912 (printed in the YEAR BOOK for 1917),

which was in turn revoked by Ordinance V of 1913. New regulations were made in 1917, which have since been revoked, and the original regulations made in 1913 are now in force.

ADMINISTRATION.

The following pages contain the text of:—

- A—Ordinance No. V of 1913.
- B—Schedule based thereon.
- C—Form of Experiment Licence.
- D—Form of Ship Licence.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

Dated June 19th, 1913.

A Be it enacted by the Governor with the advice and consent of the Legislative Council as follows:—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal. or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under or in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such purpose as the Governor may determine and shall contain the terms, conditions and restrictions on any subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship whether British or foreign while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this ordinance and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a stipendiary magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to

the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any officer of constabulary or any person appointed in that behalf by the Inspector-General of Constabulary and named in the warrant and a warrant so granted shall authorise the officer of constabulary or person named therein to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds and upon such conviction the court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a stipendiary magistrate on the complaint of the Inspector-General of Constabulary or of any person thereto authorised by him in writing and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance 1912 is hereby repealed.

Passed in Council this twenty-sixth day of May in the year of our Lord one thousand nine hundred and thirteen.

SCHEDULE.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with:—

(a) Naval signalling; or

(b) The working of any wireless telegraph station lawfully established installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

LICENCE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES, GRANTED BY THE GOVERNOR IN PURSUANCE OF SECTION 3 OF ORDINANCE NO. V OF 1913.

C Licence is hereby granted to of (hereinafter called the licensee), subject to the conditions hereinafter contained during the term or period commencing on the and terminating on the day of

(i) To establish, install and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) To transmit and receive messages by means of wireless telegraphy at the said stations.

Provided that the licensed apparatus shall be worked and the messages shall be transmitted and received solely for the purpose of conducting experiments in wireless telegraphy and for no other purpose whatever.

2. The licensed apparatus shall not be used by the licensee or by any other person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

3. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony of Fiji or the territorial waters abutting on the coasts of the Fiji Islands by or for the purpose of the Government of Fiji or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary or prescribed by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

(4) The licensee shall at all times indemnify the Government against all actions, claims and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act, licensed or permitted, by these presents,

4. (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) Whenever the operators at any of the said stations of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding, they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall, if so required, in writing by the Colonial Secretary cease to use the licensed apparatus for such period (not exceeding... hours in any one day) as may be specified by the Admiralty.

(4) If the Governor is of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this Indenture.

5. Neither the licensee nor any person on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by or for the purpose of the Government of Fiji, or by any licensee of the Colonial Secretary (other than the licensee).

6. The Superintendent of Telegraphs and Telephones and his engineers, agents and assistants may, from time to time, and at all reasonable times, enter upon any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the working and user of such apparatus and telegraphic instruments respectively, and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the said Superintendent the right for the purpose aforesaid of entry from time to time and on such of the said stations and premises as may be in the possession or occupation of any person or persons other than the licensee.

7. (1) All apparatus used or intended to be used under this license shall be so erected, fixed, placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance, working or user of any telegraphic line of the Government which may from time to time exist or which it is probable that the Government may have occasion to erect, place, fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof,

(2) In case any telegraphic line of the Government shall be damaged or the efficient working or user thereof shall be wholly or partially interrupted or otherwise interfered with and the Superintendent of Telegraphs and Telephones for the time being shall certify in writing under his hand that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used under this licence or by anything done by, on behalf, or with the permission of the licensee in relation thereto the licensee shall on demand pay to the Colonial Secretary all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order, and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said engineer shall certify that such addition or substitution is reasonably required.

8. Except with the consent in writing of the Colonial Secretary the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences, powers or authorities.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the licensed apparatus as is within the Colony of Fiji or the territorial waters thereof or any part of the licensed apparatus to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the Governor may enter upon stations specified in the Schedule hereto or any of them and take possession thereof and use the same as aforesaid.

10. The Colonial Secretary may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach, non-observance on non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may in writing revoke and determine those presents and the licensed powers and authorities hereinbefore granted and each and every of them, and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Nothing in these presents shall prejudice or affect the right of the Governor from time to time to establish, extend, maintain and work

any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise in such manner as he shall in his discretion) think fit, neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreement for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony of Fiji by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

13. Any notice, request or consent (whether expressed to be in writing or not) to be given to the licensee under these presents may be served by sending the same by registered letter addressed to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to the Colonial Secretary.

By Command,

Colonial Secretary.

Given under my hand this day of

THE SCHEDULE BEFORE REFERRED TO :

Name of Station.	Character of Apparatus.		
	Maximum range of signalling with the Licensee's	Power (Current and Voltage).	Source of Power.

SHIP LICENCE.

THE WIRELESS TELEGRAPHY ORDINANCE, 1913.

D

Governor.

To all to whom these presents shall come, I, send greeting.

Whereas..... of..... (hereinafter called "the licensee") is desirous of establishing, installing, working and using, on a ship or ships belonging to the licensee Wireless Telegraph as defined in Section 2 of the Wireless Telegraphy Ordinance, 1913:

And whereas by reason of the provisions of the Wireless Telegraphy Ordinance, 1913, it is unlawful to establish any wireless telegraphy station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor:

And whereas at the request of the licensee I have agreed to grant to the licensee the licence powers and authorities hereinafter expressed and contained for the period upon the terms and

subject to the stipulations and conditions hereinafter appearing:

Now therefore I,

in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the day of _____, 19..

and thereafter so long as the Wireless Telegraphy Ordinance, 1913, shall continue in force unless and until these presents and the licence or permission hereby given shall be determined as hereinafter provided licence and permission—

(i) To establish, install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Provided that—

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, as is specified in the said Schedule opposite to the name of such station:

(b) The apparatus installed at each ship station shall be of the character specified in the said Schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraphic Convention, 1912;

(e) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Government of the Colony for the time being or as may be otherwise directed by the Governor and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Governor. Provided always that the wavelength of 600 metres shall normally be used for communications and further that the wavelength of 1,800 metres may be used in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraphic Convention, 1912. Provided further that only the wavelength of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(f) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute, five letters being counted as one word.

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with my consent in writing send or receive messages from and at the said ship stations when in any of the harbours of the Colony; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that it to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th, 22nd July, 1875, and the Service Regulations made thereunder and include respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraphic Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) The provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall so far as possible receive from ships and light stations all request for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12. (1) The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion and the licensee shall provide for the working of each station such operators as are required by the provisions of Article X of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, according to the class of the ship station and shall observe the regulations as to the working of the ship station laid down according to its class by Article XIII of the said Regulations.

(2) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this licence unless it bears a statement that it is issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion in accordance with the Radiotelegraphic Convention, 1912. Such certificates will be valid only during the operation of the said Convention. When issued by the Governor such certificates will be granted to persons of such technical proficiency and will be in such form and will be subject to such conditions as the Governor shall from time to time prescribe and they may be by whomsoever issued, endorsed or withdrawn at the discretion of the Governor in case of misconduct or breach on the part of the holder of the regulations prescribed for the working of ship stations.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of section 11 of the Post Office (Protection) Act, 1884, and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of the licence entitling the Governor under Clause 22 hereof to revoke and determine this licence.

14. The licensee shall keep full account records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Governor shall from time to time reasonably require to be shown; messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraphic Convention, 1912, and such registers and message papers shall be open to the inspection of the Governor or his officers thereto authorised at the office of the licensee in Fiji or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a general or public holiday.

15. The licensee shall render to the Governor such accounts as the Governor shall direct in respect of all charges, if any, due or payable under the Radiotelegraphic Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Colonial Treasurer at such times and in such manner as the Governor shall direct all sums which shall be due from the licensee under such accounts.

16. The Governor and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instrument respectively.

17. The licensee shall carry on every ship on which a ship station is established under this licence a print or copy of the licence certified under the hand of the Colonial Secretary of the Colony of Fiji or appropriate officer of the Postmaster-General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraphic Convention, 1912.

18.—(1) The licensee shall pay to the Colonial Treasurer for and in respect of the licence hereby granted a royalty of 10s. per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st January in each year during which the licence remains valid.

19. Except with the consent in writing of the Governor the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences, powers or authorities.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval, Military, Customs or Police officer or any other person authorised by the Governor to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any officer or person so authorised may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. At any time after the day of 19 , the Governor may in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Governor under any condition or provision herein contained.

22. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Colonial Treasury under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or,

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained;

then and in any such case the Governor may by notice in writing under his seal revoke and determine these presents and the licences, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Governor under any condition or provision herein contained.

23. Nothing in these presents contained shall prejudice or affect the right of the Governor from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor or any other person by or under any Imperial or local enactment or by or under any agreement relating to the transmission of messages by ordinary land and submarine telegraphy.

24. Any notice request or consent (whether expressed in writing or not) to be given by the Governor under these presents may be under the hand of the Colonial Secretary of the Colony of Fiji and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Fiji.

As witness my hand and seal this
day of.....
one thousand nine hundred and.....

By Command,

Colonial Secretary.

Signed, Sealed and Delivered by.....
in the presence of.....

THE SCHEDULE OF SHIP STATIONS BEFORE REFERRED TO.

Name of ship on which station established.	Class of ship station under the Radiotegraphic Convention, 1912.	Nature of services performed	Hours of service.	Normal range of signalling in nautical miles.		Character of apparatus.		Power.		If alternator is used, number of cycles per second.
				By night.	By day.	System of radio-telegraphy with the characteristics of the system of Emission.	Wave-lengths (in metres).	Source and maximum output.	Maximum to be taken in sending Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

FINLAND

(See Maps 3, 9 and 12)

THE independence of Finland was proclaimed during the Russian revolution and a Republic set up, adopting the new Constitution in 1919.

CONTROL AND ORGANISATION.

The Government possess the sole right to erect and use wireless telegraph and telephone systems on Finnish Territory. Private persons may erect and use wireless telegraph and telephone appliance on land, ships and aircraft, subject to obtaining permission from the Ministry for Communications and Public Works. The systems now in use are under the administration of the War Ministry; the care and protection of all systems being under the control of the Army Wireless Corps, both as regards their construction and use.

ADMINISTRATION.

Wireless communications are carried out in accordance with the International Telegraph Convention (concluded at the Wireless Conference in London in 1912).

The following Laws have been passed regarding the construction and use of wireless telegraph and telephone systems:—

A—Law respecting Electric Plants for Wireless Telegraphy and Telephony.

B—Order in Council concerning the use of Wireless Telegraphy on board Foreign Ships.

C—Charges for Wireless Communications.

LAW

RESPECTING ELECTRIC PLANTS FOR WIRELESS TELEGRAPHY AND TELEPHONY.

Given in Helsingfors, December 23rd, 1919.

1. The Government has the sole right on the territory of the State to erect and use electric plants for wireless telegraphy and telephony.

2. Private persons may, however, also, by special permission, erect and use such plants as mentioned in the preceding paragraph, subject to the regulations set out hereinafter.

3. A person who wishes to erect such plants as mentioned in Art. 1 on land, stationary ship, movable ship or aircraft, shall apply for the necessary permission to the Ministry for Communications and Public Works.

4. The permission mentioned in Art. 3 shall be granted in accordance with the general principles laid down by the Council of State for a limited period in no case exceeding ten years.

5. The Council of State shall sanction the regulations required for the use of the systems, which this law refers to, in foreign ships moving in Finnish territorial waters.

6. Any person who erects or uses a system to which this law refers, without having obtained the required permission, shall be fined by penalty of 500—10,000 Finnish marks, with the forfeiture of the system at the same time, except in cases where the act is of such a nature that the criminal law prescribes a more severe punishment.

Should the system not have been constructed in accordance with the regulations laid down for the granting of the permission, or should the regulations in any other way be infringed, a fine not exceeding 1,000 Finnish marks shall be imposed, unless the criminal law prescribes a more severe punishment.

Should a system be constructed without the required permission, or against the regulations issued at the time of the granting of the permission or should the regulations in any way be infringed, it is the duty of the Governor of the Province concerned to take immediate steps for the prevention of the use of such a system. The instructions given by the Governor in the matter must be complied with, notwithstanding appeals, until otherwise is decided.

7. If sentence shall have been passed in accordance with Art. 6, para. 2, the Ministry for Communications and Public Works shall have the right to withdraw the permission granted.

8. The provisions made in the criminal law, Chapter 40, Section 15, for the protection of telegram correspondence and telegram immunity shall also apply to information transmitted through the systems referred to in this law.

What, in the said section, is stipulated about telegraph officials shall also apply to persons employed in the privately owned telegraph and telephone stations established by virtue of this law.

9. The provisions of the Criminal Law, Chapter 34 Section 12, and Chapter 35 Section 1, concerning prevention of or interference with the work of telegraph and telephone stations, or the causing of damage to telegraph or telephone, shall also apply, where possible, to such systems as this law refers to.

To be observed by all whom this law may concern.

Helsingfors, December 23rd, 1919.

K. J. STAHLBERG,
President of the Republic.

SANTERI POHJANPALO,
Minister for Communications and Public Works.

ORDER IN STATE COUNCIL.

B Concerning the use of wireless telegraph and telephone systems on board foreign ships when moving in Finnish territorial waters.

Given in Helsingfors, September 29th, 1921.

By virtue of the law concerning electric plants for wireless telegraphy and telephony, given December 23rd, 1919, the Council of State has issued the following Order:—

1. Electric systems for wireless telegraphy and telephony on board foreign ships, not stationary in Finnish territorial waters, may be used in a Finnish harbour only by special permission granted by the Telegraph Administration after consultation with the Chief of Staff for Coastal Defence, and subject to the regulations laid down by the Telegraph Administration.

Neither may the systems mentioned in the preceding clause be used on board foreign ships in Finnish territorial waters within less than ten (10) nautical miles' distance off a Finnish coastal station, except in cases of distress or

when required for telegraphic communications with the nearest situated coastal station.

The Telegraph Administration shall have the right, after consultation with the Chief of Staff for Coastal Defence, to prohibit or limit the use of telegraph or telephone systems on board foreign ships, except in cases of distress, also when in other parts of Finnish territorial waters than those mentioned.

2. The Telegraph Administration shall have the right to issue instructions for the prevention of the use of Wireless telegraph and telephone systems on board foreign ships within such territory where the use of such systems in accordance with Art. 1 is prohibited.

3. It shall be the duty of the Telegraph Administration to publish in a suitable way for the information of seafaring people, either once for all or for certain periods or certain cases, regulations and instructions issued in pursuance to Art. 1, para 9, and Art. 2. The Mercantile Marine Board, the Customs authorities, and the Governors of the Provinces concerned, shall, through their subordinates, supervise the observance of the regulations and instructions thus issued.

4. When wireless telegraph and telephone systems are used on board foreign ships sailing in Finnish territorial waters, the regulations in force, contained in the International Wireless Telegraph Convention and Service Instructions pertaining thereto, shall be observed where applicable, except in cases for which otherwise is stipulated.

5. Infringement of these regulations, or of any regulations issued by the Telegraph Administration by virtue of this Order, shall be punished with fines of 500—5,000 Finnish marks.

6. Legal actions for infringements, as mentioned in Art. 5, shall be brought before the town court of the nearest town.

7. The provisions laid down in Arts. 5 and 6 do not apply to warships.

To be observed by all whom this Order may concern.

Helsingfors, September 29th, 1921.

ERKKI PULLINEN,
*Minister for Communications
and Public Works.*
K. R. SALOVIUS.

C The President of the Republic has fixed the following charges for wireless communications temporarily conducted in accordance with the Order in State Council:

1. For communications exchanged between the Finnish mainland and Finnish vessels, and *vice versa*.

A charge per word, which shall include the coast or wireless telegraphic charge of 30 centimes and the ship's charge of 15 centimes per word, as well as the charge for each word paid for telegraphic communications by wire. The rate of exchange chargeable for the centime shall be that charged in each case for telegraphic communications by wire with foreign countries. The minimum fee for telegrams transmitted through wireless telegraph, including the wire charge, is 12 Finnish marks.

2. For other wireless communications:

The same charge, as stipulated by International Regulations, and when necessary also including the charges for telegraphic communications by wire.

The coast charges will be collected from foreigners in accordance with International Regulations.

There are at present 19 Finnish passenger and merchant ships equipped with wireless.

FRANCE AND ALGERIA.

(See Maps 2 and 7)

*Including : Andorra and Corsica.***CONTROL.**

RADIOTELEGRAPHY in France is a State monopoly. The commercial use of wireless telegraphy in France and Algeria has been placed under the control of the Minister of Posts and Telegraphs. The Department of Telegraphs deals with all matters relating to the administration of commercial wireless telegraphy, and also controls inland and foreign telegraphs. The Ministry of War and the Ministry of Marine control the use of wireless telegraphy in the Army and Navy respectively.

The high power radiotelegraph stations of France are under the jurisdiction of different Government Departments, as follows :—

Eiffel Tower Ministry of War.
 St. Pierre des Corps do.
 Basse-Lande (Nantes) Ministry of Marine.

La Doua (Lyons)
 Bordeaux-Lafayette
 (Croix d'Hins)

These two stations, erected by the War Department, are worked by the Administration of Posts and Telegraphs, for Public Service, principally for communication with the stations of the French Inter-Colonial districts.

A large high power station is under consideration by the authorities. It will be situated at Pézenas.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
M. le Capt. de Vaisseau Lagorio . .	Directeur du Service de la Télégraphie sans Fil	5 rue Froidevaux Paris (14 ^{ème})
M. Lahaye	Ingénieur au Service de la Télégraphie sans Fil	do.
M. Hamel	do.	do.
M. le Corbeiller	do.	do.
M. Veaux	do.	do.

The continental and transcontinental stations at S. Assise are operated by the Cie Radio—France.

ADMINISTRATION.

Licences for the erection and maintenance of ship stations are issued to steamship companies. The form of such licences and the contract indicating the conditions under which is accorded authorisation to install wireless telegraphy on board ships will be found below.

The administration of radiotelegraphy is governed by the following enactments, supplemented by a Form of Ship's Licence :—

A—Decree, dated March 5th, 1907 (modified by subsequent enactments).

B—Decree, dated February 24th, 1917.

C—Decree, dated December 15th, 1917 (modified by Decrees of May 15th, 1919, and March 21st, 1920).

D—Form of Ship's licence.

E—Decree of July 31st, 1919.

F—Decree of August 9th, 1920.

G—Decree of August 26th, 1920.

H—Decree of May 15th, 1921, modifying Article 3 and 4 of the Decree of February 24th, 1917.

- I**—Decree of June 2nd, 1920, relative to the establishment of private wireless communications.
- J**—Decree of June 18th, 1921, Licences for experimental etc., stations.
- K**—Administrative Order of December 30th, 1922, relating to Receiving Stations.
- L**—Wireless Telegraphist's (Ship) qualification examinations,
- M**—Projected Decree, regulating the licensing and control of private wireless transmitting and receiving stations.
- N**—Decree dated April 6th, 1923, relating to Wireless Telegraphy on Ships.

A The following is the Decree dated March 5th, 1907 (modified and completed by the following decrees): April 26th, 1910; February 5th, 1911; May 27th, 1911; November 20th, 1911; July 31st, 1919, which superseded the decrees of February, 1903, and February 27th, 1904 :—

ART. 1.—All wireless telegraph stations in France, in Algeria and in the Colonies are in times of peace worked by the Administration of Posts and Telegraphs with the exception of :—

(a) Coast stations communicating with warships and naval establishments ashore.

(b) Stations on military territory, or engaged solely on military work.

(c) Stations which are purely military in character and which in times of peace are only occupied in periodically exchanging practice telegrams.

(d) Special stations on lighthouses and buoys.

(e) Stations erected for internal communication, either within the boundaries of any one territory, or to communicate between two neighbouring territories, two groups of neighbouring territories, and a colony, or a group of colonies, with a neighbouring foreign country always providing, of course, that for other than local communication (which would be exceptionally allowed).

Questions of contract and tariff would be regulated between the departments concerned (Ministry of the Colonies), Administration of Posts and Telegraphs and, if existing, Ministry of Foreign Affairs.

Any deviation from this rule will form the subject of discussion between the Ministries concerned.

ART. 2.—In the event of mobilisation all radiotelegraphic stations, without exception automatically fall under the authority of the Ministries of War and of the Navy.

In case of mobilisation the Ministries of Marine and War shall automatically assume control of all stations, without exception.

3. The choice of sites for the proposed range of a station and all technical conditions applicable to each projected station shall be submitted for the consideration of an Inter-ministerial Commission formed in accordance with Article 4 of this Decree. The function of this Commission is to study the various aspects of the service; to be carried on and to indicate to the Administrative Departments affected the conditions that are necessary to reconcile their respective interests.

4. The Inter-ministerial Commission shall be appointed by the Minister of Public Works, Posts and Telegraphs, and shall comprise the following members :—

One President and one Vice-President appointed by Presidential decree from the Departments interested.

Three representatives from the Ministry of Marine.

Three representatives from the Ministry of War.

Two representatives from the Colonial Office.

One representative from the Foreign Office.

One representative from the Ministry of Commerce and Industry.

Four representatives from the Ministry of Public Works.

Three representatives from the Administration of Posts and Telegraphs.

A secretary who shall belong to the Post and Telegraph Administrations. He shall have no voting powers.

5. The Commission shall examine the title to sites and technical conditions appertaining to all stations which shall constitute the French radiotelegraphic network; examine complaints regarding French stations; consider such administrative problems concerning the radiotelegraphic service as the Ministry of Public Works, Posts and Telegraphs deems fit to submit to it; institute experiments of general interest. The Commission shall be informed through the departments represented thereon of results obtained by various types of apparatus employed at stations in operation.

6. Exclusive of the periods of mobilisation, stations established, kept up, and worked by Administrations other than that of Posts and Telegraphs may be open to public service in agreement with the Administration.

7. The Post and Telegraph Administration shall be responsible for all matters concerning the collection and taxes, foreign stations, and the International Bureau at Berne. It shall supervise the administration of international regulations in so far as they concern commercial traffic passing through coast stations in France, Algeria, and Tunis, as well as through stations on vessels of the mercantile marine.

8. Licences to establish private stations shall be granted by the Post and Telegraph administration referred to in Article 4. Such licences shall only be of a temporary character, and the stations are strictly forbidden to interfere with the working of other stations.

9. Cost of experiments carried out on the demand of the Commission are regulated by special credit, negotiated through the budget of the Administration of Posts and Telegraphs.

10. The Ministers of Public Works, of Posts and Telegraphs, of War, of Marine, of Colonies and Foreign Affairs are charged in so far as concerns their respective departments, with the carrying out of this decree.

11. The provisions of the decree of February 7th, 1903, and of the decree of February 27th, 1904, are abrogated.

12. The provisions of Articles 2, 3, 5, 6, 7, and 8 are not applicable to the Colonies as far

as local stations, as defined in Paragraph (e) of the 1st Article, are concerned.

The organisation of these stations, in the event of mobilisation, is regulated by Governors General and Governors in agreement with the Departments of War, of the Navy and of Colonies.

The personnel of the Administration of Posts and Telegraphs attached in any Colony to an Inter-Colonial Wireless Telegraph Station, not falling under one of the headings specified in Paragraph 5 of the 1st Article receives its working instructions from the Metropolitan Administration of Posts and Telegraphs.

These instructions are transmitted to it through the intermediary of the Administrative Authority of the Colony, except in case of urgency, and on condition that this authority is advised of them with as little delay as possible.

This personnel is placed, in regard to general discipline, under the surveillance and the authority of the high functionary who administers the territory in which is located the station. This high functionary gives to the supervised personnel annual notes, a record of which is kept in connection with their advancement.

Modifications other than those connected with the material of the stations, questions concerning the working and general organisation of the service are regulated in agreement with the Metropolitan Administration of Posts and Telegraphs and the Colony.

Colonial Military Stations are under the supreme authority of the respective Governors.

B DECREE of February 24th, 1917, relating to the reception and transmission of radiotelegraphic signals.

ART. 1.—Private individuals and corporations are forbidden to establish or make use of telegraphic machinery, or apparatus, or any fittings whatsoever capable of transmitting or receiving signals, without the express authorisation of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs either on French territory or above that territory, or on board French vessels.

The employment on board foreign vessels in French territorial waters of wireless apparatus or installations, is forbidden, except in conformity with the rules laid down by the French Government for the employment of such apparatus and installations in the aforesaid territorial waters.

ART. 2.—Authorisation for the establishment of a transmitting radiotelegraphic station is only granted to private individuals, or corporations, under the proviso that no let or hindrance shall be able to arise therefrom to the detriment of the working of public stations. The minister, whenever he shall think fit to authorise (after consultation with the Ministers of War and Marine) the establishment of any proposed station, shall lay down the conditions under which that station shall be erected and worked.

ART. 3.—Receiving wireless stations require the same authorisation, under the same conditions as transmitting stations.

It is understood, however, that stations destined for the reception of time and weather signals, whose erection is sought by French citizens, may receive due authorisation by the head of the local Postal and Telegraphic Service (when the latter is asked to do so by the parties interested) under the conditions laid down by a Decree of the Minister for Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (after consultation with the Ministers of War and Marine). Special measures may be carried

out under the authority of the Ministers of War and Marine in view of the concession in favour of stations of the kind above mentioned in certain stated districts.

ART. 4.—The royalties due from those who have been granted leave to erect stations are fixed by the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs and worked in consultation with the Minister of Finance.

Stations for the reception of time and weather signals shall be only liable to payment of a fixed royalty of five francs per year per station.

ART. 5.—In times of war—

(a) All private wireless stations, with the exception of those used by, or on behalf of military authorities must be dismantled. The owners of such stations must remove the antennæ, and deposit the essential parts of their sending and receiving apparatus in places designated for that purpose by the Postal and Telegraphic authorities.

(b) The antennæ of wireless stations of mercantile vessels must be dismantled during the whole of the stay of such vessels in French ports and/or territorial waters, unless they have received special authorisation not to do so from the Naval Authority. Moreover, the Marconi Cabin must be locked up and the key placed in the hands of the master of the vessel. No work (either in the way of overhaul, repair, etc.) may be executed unless the aforementioned offices has assured himself that the work is being carried out by persons authorised to do so.

(c) It is within the option of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (acting after consultation with the Minister of War and Marine), to prohibit for the time being all manufacture, vending or sale of radiotelegraphic apparatus, except under special licence.

ART. 6.—The rules laid down under Chapter V of the Decree-Law, dated December 27th, 1851, are applicable to the conditions laid down by the present Decree.

In times of war any representative of the Minister of War, or the Minister of Marine shall be qualified equally with the Minister himself to institute the proceedings provided for in Art. 10 of the aforesaid Decree-Law.

Moreover, in times of war the War Office and Admiralty shall also have power to take the provisional measures laid down in Art. 12 of the Decree-Law of December 27th, 1851, if in their opinion such measures are matters of urgency.

Statements drawn up by officers of the French Forces, either on land or sea shall not require to be taken on oath. They are to be viewed as absolutely reliable unless the contrary shall have been proven.

C Decree of December 15th, 1917 (as modified by Decrees of May 15th, 1919, and March 21st, 1920).

ART. 1.—The Ministers of Commerce, of Industry, of Posts and Telegraphs have appointed an extra Parliamentary Committee charged :—

(1) With the centralisation and examination of all general questions concerning the establishment of radiotelegraphic services and the exploitation of Inland, Inter-Colonial and International Wireless Telegraphy with the exception of the following :—

(a) The Military and Naval Organisation of the Inter-Allied Services established purely for Military or Naval purposes.

(b) Colonial services organised to ensure internal communications in any particular colony, or between two neighbouring colonies, two neighbouring groups of colonies, and a colony, or a group of colonies with neighbouring foreign countries.

(2) As a result of this examination to prepare on broad lines legislative, or administrative regulations to be brought into force as soon as possible after the cessation of hostilities, the National Organisation of the Radiotelegraph Service which forms a part of the General Telegraph Service without infringing Art. 2 of the Decree of March 5th, 1907.

ART. 2.—This Commission will be composed as follows:—

Four members of the Senate.

Eight members of the Chamber of Deputies.

Seven representatives of the Ministry of Public Works, i.e.:

(a) Four representatives of the Administration of Posts, Telegraphs and Telephones.

(b) One representative of the Services of Harbours of the Mercantile Marine and of Fisheries.

(c) One representative of the Service of Lighthouses and Buoys.

(d) One representative for the Service of Civil Aeronautics and Aerial Transport.

Three representatives of the Ministry of War.

Three representatives of the Ministry of Marine.

Three representative of the Ministry of Colonies.

One representative of the President of the Council.

One representative of the Ministry of Foreign Affairs.

One representative of the Ministry of the Interior (service of public safety).

One representative of the Ministry of Public Instruction.

One representative of the Ministry of Finance.

Two representatives of the Radioelectrical Industry.

One representative of the Staff of the Wireless Service of the Mercantile Marine.

ART. 3.—The Commission formed under the present Decree will be presided over by the Under-Secretary of State for Posts and Telegraphs, assisted by two Vice-Presidents chosen from amongst the Members of Parliament.

ART. 4.—The members of the Commission will be nominated by a Decree based on the report of the Minister of Posts and Telegraphs, of the Minister of War, of the Minister of Marine, and of the Colonial Minister, after the Head of each of the other Administrations mentioned in Art. 2 above shall have named their representatives to the Minister of Posts and Telegraphs.

ART. 5.—The active Members of the Commission who are bound to be present at a meeting may absent themselves on condition that their place is taken by a member of their same service who will represent them with votive powers.

ART. 6.—All previous regulations on this subject are hereby abrogated.

ART. 7.—The President of the Council, the Minister of War, and the other Ministers interested are charged, in so far as concerns their respective departments, with the carrying out of this Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

FORM OF SHIP'S LICENCE.

D FRENCH REPUBLIC; MINISTRY OF COMMERCE AND INDUSTRY, POSTS AND TELEGRAPHS.

Office of Control, Telegraphic Administration.

Licence delivered in accordance with Article IX of the International Radiotelegraphic Convention Service Regulations.

In consideration of the undertaking given by the applicant and the particulars furnished by.....

And in consideration of the arrangements under the Convention and the Radiotelegraphic Regulations as codified in London on July 5th, 1913; and especially of Articles III, VII, VIII, X, XI, XIII, and XVI of the aforesaid Regulations.

And in consideration of the report supplied by the Engineer-in-Charge of the Radiotelegraphic Service following on his visit to the station on board.....

Authorisation is hereto given for the installation and maintenance of the radiotelegraphic station on board the which is scheduled under Class.....

The present licence is available for as long as the Radiotelegraphic Convention and Regulations of London remain in force.

Given in Paris on the.....day of.....

(Signed) on behalf of the Minister of Commerce, Industry, Posts and Telegraphs by.....

Chief of the Telegraphic Administration.

UNDERTAKING

GIVEN BY.....

Who in consideration of an authorisation to install and maintain a wireless telegraph station on board the s.s. declares himself willing to submit, without reserve, to the clauses and conditions of the agreement whereof the text is herewith subjoined, with the object of obtaining such authorisation for utilising a wireless station on board the s.s.

ART. 1.—The installation of the proposed wireless station shall be submitted to the preliminary approval of the Administration of Posts and Telegraphs. Only apparatus manufactured in France, from materials supplied by builders or manufacturers having their workshops in France, can be employed in the construction of this radiotelegraphic station.

The average range of the station shall be

In the event of its being recognised—in consequence of improvements carried out in radiotelegraphy (affecting range, sympathy, wave direction, etc.)—that important modifications can be adopted in the ship's station, the Administration of Posts and Telegraphs reserves to itself the right of providing for the adoption of such improvements.

Every subsequent alteration made to the station must be notified to the Administration of Posts and Telegraphs and receive official approval before its inception.

ART. 2 —..... shall take every care necessary to ensure that the installation, maintenance, and usage of the station, as well as any modifications introduced in accordance with the preceding article, shall be carried out without involving any expense to the Administration of Posts and Telegraphs.

ART. 3.—All contracts, agreements, etc., which have been entered into, or which shall in the future be entered into, between and the manufacturers of wireless apparatus, or which have been or shall be made with wireless companies, for the construction and maintenance of the station, shall—before being put into effect—be submitted for the approval of the Administration of Posts and Telegraphs.

ART. 4.—A charge in favour of the ship's station may be levied on the aforementioned vessel; its amount being fixed by the Administration of Posts and Telegraphs in agreement with This charge shall not be made on official communications of the French Republic.

..... shall be liable to be called upon to place in an office of the Posts and Telegraphs a deposit, by way of guarantee for the charges received on board, and for which he is accountable to the Administration of Posts and Telegraphs.

In the event of the administration of the authorised station being granted to a company, shall remain responsible for the charges received on board.

ART. 5.—All telegraphists entrusted with the manipulation of apparatus must be of French nationality, and subject to the approval of the Administration of Posts and Telegraphs.

ART. 6.—The contents of telegrams transmitted by wireless, which reach the ship's station without being intended for shall not be divulged to anyone whatsoever outside the officials appointed by the Administration of Posts and Telegraphs, or the competent officers of judicial police. No use whatsoever may be made thereof.

ART. 7.—The Administration of Posts and Telegraphs may, if it seems good to them, demand at any moment, and on immediate requisition, that the station on board shall be temporarily or permanently, taken over by State officials. These officials shall be accommodated on board in the class corresponding to their grade. Their messing may be charged for, but not their transport. In such cases the Administration of Posts and Telegraphs shall render account to for the board ship charges due to him after making deduction of cost of upkeep of the station.

In the event of the Administration of Posts and Telegraphs deciding to apply the foregoing provision they may employ wireless telegraphic apparatus of a different type to that utilised by They reserve, moreover, the right, in case of need, of placing such apparatus on board in advance.

ART. 8.—The Administration of Posts and Telegraphs shall exercise in the manner which seems best to them their right of control over the authorised ship's station (installation, transmission, and reception of radiograms, rendering of accounts, etc.).

ART. 9.—The date of the initiation of the service of the ship's station shall be fixed by agreement with the Administration of Posts and Telegraphs.

After the establishment of the installation the apparatus cannot be removed without the express consent in writing of the Administration of Posts and Telegraphs. The apparatus must be continuously maintained ready for use, and must give fifteen days' notice in advance to the Administration of Posts and Telegraphs in the event of his desiring for any reason to cease to use the station.

In the event of the ship's sale must advise the Administration of Posts and Telegraphs, informing them at the same time

of the name and address of the new owner, as well of the arrangements which may have been made (should there be any such) for the closing of the station.

In any event, the aforesaid station cannot be closed down without the express consent in writing of the Administration of Posts and Telegraphs, and the holder of this licence shall remain responsible for the charges due until authorisation for transfer has been received.

ART. 10.—The licence granted to applies only to the vessel mentioned above. A new licence would be necessary, should decide to install a radiotelegraphic station on any other of his ships.

This licence can, moreover, be suspended or revoked at any time, and for any reason, without any liability on the part of the Administration of Posts and Telegraphs to pay any indemnity whatsoever, and without any obligation to state the reasons for their decision.

In particular, the licence may be revoked in the event of failure by to observe the provisions of the present agreement.

ART. 11.—..... declares that he subscribes to all the legislative arrangements and rules established, or that shall in the future be established, in France with regard to internal and international wireless service.

The wireless station which forms the subject of this licence shall exchange radiotelegrams with all the coast or ship stations within the sphere of action of which it shall come without any distinction of the radiotelegraphic system adopted by these stations.

ART. 12.—The State shall not be subject to any responsibility through difficulties which may arise between and private individuals, companies or corporations, to whom authorisation for carrying on wireless telegraph stations may have been granted; or in general with anyone soever or for any reason.

ART. 13.—The stamp duties appertaining to the present licence are payable by

Given on the day of

LAW OF JULY 31ST, 1919.

E The President of the Council; the Minister of War; the Minister of Marine; the Minister of Public Works, Transports and of the Mercantile Marine; the Minister of Commerce, of Industries, of Posts and Telegraphs; the Minister of Colonies, having seen the Decree of March 5th, 1907, Hereby decree:—

ART. 1.—Radiotelegraph Stations joining departments other than the departments of War and of Marine are in times of peace, in view of their utilisation in war time, under the control of a special commission instituted by the Minister of War (General Staff of the Army).

ART. 2.—The Commission is presided over by one of the sub-heads of the General Staff of the Army and comprises a representative of each of the following Ministries: Marine, War, Public Works, and Colonies, as well as of the Administration of Posts and Telegraphs.

These representatives, who are nominally elected by the Administrations which they serve, are in principle the Directors of the Wireless Service in their respective Administrations.

Each has an assistant, also nominally elected, and with authority to take the place of the former in case of absence.

An officer of the General Staff of the Army carries out the functions of Secretary, with voting powers.

ART. 3.—The Commission will give its advice on all questions relative to the best means of utilising Radiotelegraph Stations, both fixed and portable in time of war.

It will especially occupy itself with the control of mobilisation of Non-Military Wireless Telegraph Stations, and to investigate experiments of every kind made to improve the utility of wireless in time of war of Non-Military Stations as suggested by the different Ministerial Departments.

ART. 4.—At least once a year, and more often if necessary, the Commission will inspect Non-Military Stations and their technical equipment, and will also test the professional knowledge of the personnel. Each inspection will be made by a representative of the Administration working the station and by a representative of the Ministry of War or of the Ministry of Marine according as to whether the station falls under the authority of the one or the other.

The Commission chooses those of its members who will undertake the inspection, or will ask the departments interested to make the necessary selection from their personnel.

A *proces-verbal* will be prepared after each inspection and forwarded to the Commission.

ART. 5.—The Commission will transmit its reports and the *proces-verbaux* of its sittings to the Ministers concerned through their representatives. The Ministers will take what steps are necessary in view of these communications.

ART. 7.—In the Colonies the inspection on Non-Military Stations and of their technical equipment as also that of the professional knowledge of the personnel is carried out according to rules formulated under Articles 3 and 4, by representatives of the departments concerned who are chosen by the Governors-General or Governors.

Reports are transmitted by these High Functionaries to the Department of the Colonies. The latter formulates, if necessary, its observations or propositions.

LAW OF AUGUST 9TH, 1920.

CHAPTER I.

F STATIONS FOR THE SERVICE OF AERIAL NAVIGATION.

ART. 1.—The Service of Aerial Navigation installs and exploits all Radioelectric Stations which are necessary to assure the carrying out of the Service and the security of aviators.

ART. 2.—The technical particulars of these stations (location, power, nature of transmission, wavelength, call letters) are arranged between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport.

ART. 3.—If interference is caused by Stations of the Service of Aerial Navigation, or if these are interfered with by foreign stations the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport will agree on the technical means to be employed to avoid such interference.

ART. 4.—Certain stations of the Service of Aerial Navigation may be open to private correspondence by arrangement between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport. In this case the tax payable for each telegram will be established in accordance with the rules in force for radiotelegraphic correspondence with ships at sea.

CHAPTER II.

LAND STATIONS INSTALLED BY PRIVATE COMPANIES.

ART. 5.—Land Radioelectric Stations may be installed by Companies for Aerial Navigation,

or by private persons with the object of communicating with aviators or to ensure their safety.

These stations and their personnel will be subject to the rules already issued, or to be issued in the future by the Administration of Posts and Telegraphs, for all private Radiotelegraph Stations.

ART. 6.—Requests for permission to install stations and for licences for personnel must be sent to the Service of Aerial Navigation. If the latter decides that they are justified by the necessities of aerial traffic, and that they will not compete with its own installations, such requests are forwarded to the Administration of Posts and Telegraphs together with their remarks. If the Administration grants such authorisation this will be made through the Service of Aerial Navigation, who, in turn, will advise the applicant.

ART. 7.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the control and working of stations defined in Article 5. It retains, however, its direct right of control in so far as complaints concerning the stations or the services committed by the latter are concerned. In this case a warning is given to the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of this department may attend the enquiry and give his views. He makes a direct report to his department.

CHAPTER III.

AIRCRAFT STATIONS.

ART. 8.—Aircraft Radioelectric Stations are of two categories, those of the first category being utilised both for safety in navigation and for private communication; those of the second category being utilised solely for safety in navigation.

ART. 9.—The installation of all the stations defined in Article 8 and their control are under the same rules which regulate Wireless Stations of the Mercantile Marine.

ART. 10.—The personnel of stations of the first category are subject to the same rules as the Radiotelegraphic personnel of the Mercantile Marine.

ART. 11.—The personnel of stations of the second category must be in possession of a Special Licence granted by the Under-Secretary of State for Posts and Telegraphs.

ART. 12.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the right to authorise the installation of stations as defined in Article 8, also their control and working with the following exceptions:—

(a) Only apparatus of the type agreed upon by the Under-Secretary of State for Posts and Telegraphs may be authorised, and

(b) The Under-Secretary of State for Posts and Telegraphs exercise his direct right of control when he receives complaints concerning these stations, or of mistakes committed by them. In this case he warns the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of the latter department may take part in the enquiry and give his views. He makes direct report to his department.

ART. 13.—In order to permit of the control during a flight of Radioelectric Installations, the authority in charge of all aircraft must freely allow representatives of the Administration of Posts and Telegraphs and of the Service

of Aerial Navigation to make inspection on board from time to time.

ART. 14.—Requests for authority to install stations on board aircraft must be sent to the Service of Aerial Navigation. It should be stated whether stations of the first or second category are required.

CHAPTER IV.

ART. 15.—The stations mentioned in Articles 5 and 8 are subject to "Subscription" tax for management expenses which the Controlling Company is obliged to pay over to the Treasury. This Subscription Tax is fixed at 200 francs annually per kilowatt and per station, any fraction of a kilowatt being counted as one kilowatt and the minimum amount payable per station being fixed at 200 francs. It is payable to the State on January 1st for a complete year, and is due from the day when the station is put in commission; for the first year the amount is calculated proportionately to the time yet to run before December 31st.

ART. 16.—Any company which benefits under the arrangements of this regulation for a given time will only be taxed for a portion of the aircraft affected. The Under-Secretary of State for Aviation and Aerial Transport will determine the number of the latter; failing the total of aircraft affected the number of them which should come within the scope of this regulation.

ART. 17.—Every time that an aircraft is replaced by another the licence granted for the wireless station will be valid for the second machine and a fresh tax will not be payable.

ART. 18.—In all localities where no Radioelectric Station controlled by the Administration of Posts and Telegraphs exists for communication with aviators, the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must receive and transmit gratuitously all Official Government Telegrams, on condition that they enamate from or are destined for aircraft.

ART. 19.—In case of interruption of their radio communication the Service of Aerial Navigation and the Controllers of the Station named in Article 5 are authorised to route their urgent service radio communications through the Administration of Posts and Telegraphs, which will give them priority in transmission.

Reciprocally the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must, in the case of interruption of radio communications of the Administration of Posts and Telegraphs, transmit gratuitously through their stations during the hours at which they are open, official or private telegrams destined for aircraft which may be sent to them by the Telegraphic Offices of this Administration.

ART. 20.—Radio communications relative to the flight and safety of aircraft have priority over those set out in Articles 4, 18, and 19.

ART. 21.—The present law will be deposited with the Under-Secretary of State for Posts and Telegraphs (Central Service) and with the Under-Secretary of State for Aviation and Aerial Transport for notification to those whom it concerns.

DECREE OF AUGUST 26TH, 1920, FIXING THE TAX FOR RADIOGONIOMETRIC MESSAGES.

G ART. 1.—Each Radiogoniometric Message sent by a Land Station at the request of a Mobile Station (Aircraft) will be liable to a fixed Coast Tax of 6 francs.

ART. 2.—Mobile Wireless Stations belonging to the Departments of the Navy and of War (warships and war aircraft) are exempted from the Radiogoniometric tax.

ART. 3.—In accordance with Article 6 of the Law of November 29th, 1850, the State accepts no responsibility in connection with Radio goniometric Messages.

ART. 4.—The date of the announcement of the application of the tax mentioned in Article 1 will be fixed by a Law of the Under-Secretary of State for Posts and Telegraphs.

ART. 5.—The Minister of Public Works and the Minister of Finance are charged, in so far as they are respectively concerned, with the carrying out of the present Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

DECREE OF MAY 14TH, 1921, MODIFYING ARTICLES 3 AND 4 OF THE DECREE OF FEBRUARY 24TH, 1917, RELATING TO RECEIVING STATIONS.

H ART. 1.—The dispositions of Articles 3 and 4 of the Decree of February 24th, 1917, relative to the reception of radioelectric signals are modified as follows:—

ART. 3.—Radioelectric receiving stations of all kinds are authorised under the conditions fixed by a special law for each category made by the Under-Secretary of State of Posts and Telegraphs after notice due to the ministerial departments interested.

ART. 4.—The royalties payable to the concessionaries of the authorised stations are fixed by the Under-Secretary of State of the Posts and Telegraphs by agreement with the Minister of Finance.

Stations for the reception of time and meteorological signals and experimental stations are subject to a payment fixed at 10 francs per station per year.

ART. 2.—The Ministries of Public Works, of War, the Navy and Finance are charged etc.

DECREE of June 2nd, 1920, relating to the establishment of private radioelectric communications.

I The Under-Secretary of State for Posts and Telegraphs.

Considering the decree law of December 27th, 1851, concerning the monopoly and the surveillance of the telegraph lines.

Considering the law of April 5th, 1878, relating to the subscriptions agreed to at reduced prices with regard to telegraphic correspondence.

Considering the decree of May 13th, 1879, relating to the concessions of private telegraph lines.

Considering the decree of February 24th, 1917, relating to the reception of radioelectric messages.

Considering the law of March 29th, 1920, relating to the increase in postal, telegraph and telephone charges.

Proposed by the Director of Telegraphic Exploitation.

ORDERS.—The conditions of establishment and use of the radioelectric stations, which, by application of the decree of February 24th, 1917, can be conceded to private individuals, after judgment of the Ministers of War and of Marine relating to the laying of lines of communications serving for the exchange of correspondence of private interest, run as follows:—

ART. 1.—The petitioner must inform the Administration of Posts and Telegraphs of the names of the apparatus which he proposes to use, in mentioning their characteristics and

origin, as well as an idea of the communication he proposes to carry on.

He must furnish to the Administration in the course of the working of the conceded stations all information which may be demanded of him.

The stations are installed, exploited and maintained by him and at his expense.

All further modifications to these installations must be notified, first of all, to the Administration of Posts and Telegraphs.

The power of the waves issued must be strictly limited to such as to secure good communication. Only such lengths of waves may be used as is arranged by the Administration of Posts and Telegraphs after an understanding with the concessionaires.

ART. 2.—The fees fixed for right of using the private lines and stations, as well as the dispositions relative to this right of use, are applicable to the private radioelectric communications. This right of use is calculated on the basis of the number of stations belonging to one concession and the distance in kilometres, measured as the crow flies, separating two corresponding stations. When one of the stations is working, the distance considered is the average distance to which the communications reach.

The charge for the right of use is payable from the day on which communication starts working. It is calculated for the first year in proportion to the time to run till December 31st; for the following years it is acquired by the State from January 1st for the whole year, and must be paid at the first application of the Administration.

ART. 3.—The conceded radioelectric stations can only be used for the exchange of correspondence to be effected between them.

ART. 4.—The concessionaire must not divulge to any person whomsoever outside the officials appointed by the Administration or competent police officers, the contents of the telegrams or conversations collected by his stations and which may be transmitted by other radioelectric stations.

He must make no use whatever of them.

The concessionaire is responsible for any divulgations which may be made by his agents employed in the service of the conceded stations.

ART. 5.—The transmissions effected by the concessionaire must not disturb those effected by the State for its own uses.

The concessionaire must, at every request of the Administration, cease the transmission effected by his own stations during such time as is demanded.

He has to transmit, whenever required, the official correspondence, giving it priority over all other telegrams, and to assure of its despatch to the addressee, without any indemnity whatever.

ART. 6.—The Administration of Posts and Telegraphs reserves to itself the right to exercise control over the stations of the concessionaire, either permanent or temporary, as it may see fit, and in the manner in which it may seem to it most suitable. Expenses of every kind which the control should incur are repayable by the concessionaire on production of the vouchers prepared by the administration of Posts and Telegraphs 48 hours beforehand, his intention to start working his stations. The Administration may, if it recognises the necessity, demand at any moment and at the first application that the stations should be disestablished either temporarily or permanently by its agents.

ART. 7.—The State undertakes no responsibility whatever in consequence of any difficulties which may arise between the concessionaire and private individuals, companies or societies to which authorisation may have been accorded to exploit radioelectric stations or, generally speaking, with whomsoever and for whatever reason it may be.

ART. 8.—The concessions accorded are essentially precarious and revocable. In consequence the Administration of Posts and Telegraphs can, at any time and for any reason whatever, suspend or revoke the authorisations accorded without being called upon to pay any indemnity for whatever cause, nor need it give any notice for its decision.

At the first application of the Administration of Posts and Telegraphs, the concessionaire must place his stations out of working order, either for reception or transmission.

A period of one month may be allowed for the suppression of authorised stations. If this period has lapsed, the Administration of Posts and Telegraphs may proceed on its own account to the operation of such suppression costs to be paid by the concessionaire.

No radioelectric station which has been conceded may be transferred without the express written consent of the Administration of Posts and Telegraphs.

ART. 9.—The accorded concessions are in the fullest sense subject to all legal enactments, whether executive or administrative, made, or which may be made, on the subject of the exchange of messages by electric waves, of the establishment of radioelectric stations or concessions of private lines and stations, as well as any fees which may be exacted at any time.

ART. 10.—The present order will be lodged at the office of the Under Secretary of State for Posts and Telegraphs (Central Service) to be noted by whom it may concern.

Paris, June 2nd, 1920.

The Under Secretary of State for Posts and Telegraphs.

(Signed)

DESCHAMPS.

LAW OF JUNE 18TH, 1921.

J Fixing the conditions of the establishment and use of transmitting radioelectric stations, which, by the application of the Decree of February 24th, 1917, may be granted for experimental purposes after notice to the Minister of War and the Navy.

ART. 1.—Applications for licences to be addressed to the Administrator of Posts and Telegraphs.

The applicants must state the precise situation of the station, together with its principal technical characteristics (system of transmission, power, wavelength, etc.), and furnish a diagram of connections of the apparatus as it will be used.

These particulars must be accompanied by full details of the purpose of erection and use, when the applicant proposes to use a power greater than 100 watts and a wavelength of more than 200 metres.

All important modifications of principle which may be made later in the constitution of a licensed station must be notified to the Administrator of Post and Telegraphs who will examine it and make such alterations to the original licence as will render it applicable to such modification.

ART. 2.—If there is no objection to the establishment of the projected station the applicant

is invited to give under stamp in duplicate an engagement to place himself under the conditions set out by the present law.

ART. 3.—When he is notified that he has been accorded the licence, the licensee can proceed to erect his station at his own trouble and expense, the cost of maintenance falling also to him.

ART. 4.—Licences given do not constitute a privilege or prevent further licences of the same nature being given later to any applicant whatever. They are not transferable.

The licences are essentially revocable.

The Administrator of Posts and Telegraphs can at any time and for any reason suspend or revoke licences given without payment of any indemnity and without giving any reason for this decision to the licensee.

At the first request by the Administrator of Posts and Telegraphs the licensee must immediately put his station out of action. A maximum delay of one month can be given for the definite suppression of the station.

In the case where the licensee does not obey the request of the Administrator of Posts and Telegraphs they can proceed at the cost of the licensee to put out of action and suppress the said station.

The licensee can at any time by his own wish terminate his licence. In this case also are applicable the preceding dispositions concerning the putting out of action and dismantling of the station.

The licences for experimental transmitting stations being given at the holder's risk, the State has no responsibility for difficulties which may arise between the licensee and societies or companies to whom licences have also been given or in general for any cause or reason whatever.

ART. 5.—The station licensed can only be used for scientific researches or the testing of apparatus, they may not serve in any case to transmit correspondence having a character personal or actual even in the particular or personal interest of the licensee.

ART. 6.—The use by a licensee of a transmitting station with a receiving station attached entails for the licensee the obligation to submit himself to the dispositions and regulations relative to the establishment and use of radioelectric receiving stations and to apply to the Administrator of Posts and Telegraphs for the corresponding licence.

ART. 7.—The Administrator of Posts and Telegraphs reserves to itself the right to exercise a control permanent or temporary on licensed stations in any manner which appear to them to be the most convenient.

Moreover, the licensee when he is notified that he has been accorded a licence must make the payment given in Article 4 of the Finance Law of July 31st, 1920.

ART. 8.—Licences granted are subject to all laws, regulations, and legislation which may intervene.

K ORDER OF 30th DECEMBER, 1922, RELATING TO RADIOELECTRIC RECEIVING STATIONS.

The Under-Secretary of State for Posts and Telegraphs, considering the Decree of 24th February, 1917, concerning the transmission and reception of radioelectric signals;

Considering the Decree of 15th May, 1921, modifying the above;

Considering the Orders of 27th February, 1920, and 6th July, 1921, concerning private receiving stations;

Considering the advice of the Ministers of War, of the Navy and of the Interior;

On the proposal of the Director of Telegraphic Exploitation

ORDERS:—

ART. 1.—The establishment of private wireless stations employed solely for reception is authorised subject to the condition that the petitioner shall furnish in duplicate, one copy being on stamped paper, a declaration in conformity with the Schedule annexed to this order.

This declaration to be addressed to the Director of Posts and Telegraphs of the department in which the station will be installed and should be accompanied by documents proving the identity, address, and nationality of the applicant. A receipt for it is given to the applicant. In the event of the applicant being unable to prove his French nationality, the establishment of the wireless receiving stations remains subject to a special authorisation from the Under Secretary of Posts and Telegraphs, after agreement with the Departments of the Interior, Foreign Affairs, War and Navy.

ART. 2.—Receiving Stations must not cause annoyance of any kind to neighbouring stations, even in the case of receiving apparatus giving out waves of weak intensity from the aerial. Every precaution must also be taken to reduce to a minimum this emission of waves by the receiver.

ART. 3.—Private wireless receiving stations are to be established, worked and maintained under the charge and at the cost of the licensee. The State does not assume any responsibility on account of these actions.

ART. 4.—The licensee of a private wireless receiving station must observe secrecy regarding all correspondence not addressed to him and which he has intercepted. Such correspondence must not be disclosed except to officials appointed by the Administration of Posts and Telegraphs or to authorised police officials.

ART. 5.—The Administration of Posts and Telegraphs reserves the right to exercise such control as it deems fit over private wireless receiving stations.

ART. 6.—Private wireless receiving stations are subject to an annual Statistics Tax (*droit annuel de statistique*) indivisible and due from the 1st January to the 31st December in each year. This tax is 10 francs. It is chargeable on each independent receiver.

ART. 7.—The authorisations granted carry no privileges, nor can they constitute any obstacle to similar authorisations which may subsequently be granted to any other applicant. They are not transferable to a third party. They are revocable by the Under-Secretary of State for Posts and Telegraphs without payment of any indemnity and without any obligation to disclose the reason for the decision. At the first application from the Administration of Posts and Telegraphs, the licensee must at once put his station out of working order. In the event of his not obeying this injunction, the Administration may proceed to put it out of working order at the expense of the licensee.

ART. 8.—The provisions of the Orders of 27th February, 1920, and 6th July, 1921, are revoked.

ART. 9.—The present Order will be deposited with the Under-Secretary of State for Posts and Telegraphs (Central Service) for notification to those whom it may concern.

Paris, the 30th December, 1922.

(Signed) PAUL LAFFONT.

FORM OF DECLARATION FOR PRIVATE RADIOELECTRIC STATIONS.

I, the undersigned.....(name, Christian names, profession, address).....of.....nationality, declare that I am the owner of.....private wireless receiving stations for the use of which I undertake to submit, without any reservation, to all the regulations prescribed or to be prescribed regarding the establishment and use of private radioelectric stations.

Destination of the station and purpose for which it is used by the applicant.

Exact position of station.

General description of station (principal technical characteristics, type of apparatus used, number of independent receivers).

At.....the.....19

To the Director of Posts and Telegraphs at.....

Noted, without remarks.

At.....the.....19

Director of Posts and Telegraphs.

REPUBLIQUE FRANCAISE.

POSTS AND TELEGRAPHS.

Central Service for Wireless Telegraphy, 5, Rue Froidevaux, Paris 14^e

Programme defining the terms for admission to employment as a wireless telegraphist on board ship.

L

I.—EXAMINATION CENTRES.

Examinations are held principally—

1. In Paris, during the second fortnight of March and September.

2. In Marseilles during the first fortnight of January, April, July and October.

3. In Bordeaux, February, May, August and November, and St. Nazaire in the first fortnight of March, June, September and December.

4. In Boulogne-sur-Mer in July.

5. In Algiers, second fortnight of April and October.

The companies working wireless telegraphy and the wireless telegraphy schools are advised in due course of their examinations.

As regards the examinations in Paris, the papers of candidates must reach the Wireless Telegraphy Service, 20 Rue Las Cases, Paris, before February 1st, May 1st, August 1st, and November 1st, which are the latest dates of application.

As regards the Marseilles examinations, before December 17th, March 17th, June 17th, and September 17th, which are the latest dates of application.

As regards the Bordeaux examinations before February 20th, May 20th, August 20th, and November 20th, which are the latest dates of application.

Examinations may be cancelled if the number of candidates entering is insufficient. The candidates interested will be notified of this decision at least five days before the date on which the examination should take place.

II.—DOCUMENTS TO BE SUBMITTED BY THE CANDIDATES.

The wireless candidates must necessarily be of French nationality, and of at least 16 years of age on the day of examination. With the view of being authorised to enter for examination in respect of professional aptitude, they must, as a matter of principle, produce through the agency of the wireless telegraph Company which is desirous of employing them, the following documents:

1. A request for admission to the examination. The applicants may indicate the type or the types of wireless apparatus used on the French cargo boats on which they wish to be questioned, and to submit to the regulation

test, as also the place where the examination is to take place. This document, which must be written entirely in their own hand, is subject to a stamp duty of 2 francs, and must give their full address.

2. They must supply a copy of their birth certificate on stamped paper carrying a minimum tax of 3 francs, and provided by the mayor.

3. A certificate of good conduct and habits and of their French nationality provided by the Mayor or the Commissioner of Police of their neighbourhood. This document must carry a stamp tax of 2 francs.

4. If necessary, a suitable copy on plain paper of their military service and their good conduct certificate in the corps, or, in case of exception or of adjournment, a certificate stating their position from the legal point of view on the question of army recruitment. The candidates who are serving with the colours when they make their application are not obliged to furnish a certificate of good conduct and habits or of their French nationality, as a provisional certificate of good conduct supplied by the competent military authority will take the place of this document.

III.—PROGRAMME AND ORDER OF THE EXAMINATION.

The programme of the examination is based on the wireless rules for London.

It includes—

1. Practical tests in transmission and reception by ear.

2. Regulating tests.

3. A test on the working of apparatus comprising general notions on wireless telegraphy, and more particularly on the wireless system in regard to which the candidate may have asked to be questioned.

4. A test on the wireless telegraphy regulations and on the terms of the telegraphic regulation for Lisbon in so far as they apply to wireless telegrams (R.R. Art. 4).

In order to obtain a first-class certificate the candidates must be capable of transmitting and receiving messages by sound of at least 20 words per minute.

Those who attain a speed in transmission and reception per minute equal to or more than 12 words, but less than 20 words, will only be entitled to a second-class certificate.

Each of the three tests involve the allocation of a scale of 0—20.

The certificates, whether of first or second class, can only be handed to the candidates who may have obtained the note 16 as a minimum for the regulation test, and the note 14 as the minimum for the other tests.

In any case first-class certificates can only be granted to wireless telegraphists who may have reached the age of 18 years.

IV.—PROGRAMME OF WIRELESS EXAMINATIONS.

Theory—General Notions.

Difference of Potential—Electric Current—Ruhmkorff Coil—Transformers—Condensers—Production of Current—Principle of Batteries and Accumulators—Continuous Current Dynamo—Continuous Motor—Alternators—Transformation of Continuous Current into Alternating Current—Motor Generator Set—Commutator—Principle of Upkeep of Different Apparatus—Danger of High Tension—Physiological Effects—Precautions to be Observed—Measuring Apparatus—Voltmeters—Ammeters.

Wireless Telegraphy.

Electric Oscillations—Why is it necessary to have Rapid Oscillations—Detonators—Part played by the Spark—Part taken by the Capacity—Part taken by Self Induction Coil—Periods of Oscillation—Relation between the number of Oscillations per second and the length of the Wave.

Antenna.

Control—Insulation—Length of Wave proper of the Antenna—How the length of Wave is shortened or lengthened—Junction of the Excitation Circuit and the Antenna Circuit—Diagrammatic Installation of the Emission Circuits—Direct Excitation.

Reception.

Detectors—Part played by Detectors—Diagrammatic Installation of the Reception Circuit.

Syntonsisation.

Necessity for harmony between the reception and transmission circuits.

Practical Examination.

Test on the Working of the Station Apparatus—Regulation—Testing for Faults—Starting Apparatus—Methods of Reducing the Wavelength.

V.—TEST ON THE WORKING OF THE APPARATUS.

The regulating exercises and the tests on the working of the apparatus apply to one of the systems used by the French cargo boats. It is essential therefore that the candidates should arrange beforehand with at least one of the working companies, in order to submit themselves for examination on the type of apparatus which this company uses on board trading vessels.

The candidates must indicate in the application the system on which they desire to be questioned.

VI.—ISSUE OF THE CERTIFICATES.

The certificates are issued on a single sheet of paper, and must not be handed over signed to the interested candidates until after having been supplied with a 3-franc stamp (Law of 13 Brumaire year VII, Art. XIX, and April 20th, 1916, Art. 63).

The certificates are valid for the period during which the Convention and the wireless telegraphy regulation of London remains in force.

They must indicate the system of apparatus in respect of which the candidate has given proof of the necessary knowledge. The wireless operators assigned later to a station using other apparatus must undergo a new test on the working and the regulation of such apparatus (Art. X. of the R.R. of London).

VII.—ADMISSION OF LADIES TO EMPLOYMENT AS WIRELESS OPERATORS ON BOARD SHIP.

Ladies are admitted for examination as to their professional capacity for employment as wireless operators. It is necessary that the parties interested should show the indispensable physical aptitude to stand the life and fatigue of service on board ship.

The candidates must have completed their eighteenth year.

For the present they may only receive the second-class certificate.

NOTE.—The employment of wireless operators on the coastal stations of the Administration of Posts and Telegraphs is reserved exclusively for the agents of this administration.

PROJECTED DECREE

REGULATING PRIVATE WIRELESS STATIONS IN FRANCE.

MART. 1.—No private wireless installation for telegraphy or telephony may be established or used except under the conditions prescribed by the present Decree.

ART. 2.—Wireless stations employed solely for reception are divided into three categories:—

- (1) Those installed by departments, communes, public establishments or those of public utility for free performances (*auditions*).
- (2) Those installed by private individuals for public performances.
- (3) Those not intended for public performances.

ART. 3.—The establishment of private wireless stations employed solely for reception is authorised; subject to the condition that the applicant shall present, at any post office, a declaration in the form shown in the Schedule attached to the present Decree.

This declaration must be accompanied by the necessary documents proving the identity, address and nationality of the applicant.

It takes the place of the collection of a Statistic Tax (*droit de statistique*) fixed at one franc.

A receipt for it is given to the applicant.

In the case of the applicant being unable to prove his French nationality the establishment of the wireless receiving station remains subject to a special authorisation from the Under-Secretary of State for Posts and Telegraphs, after agreement with the Departments of Home Affairs, Foreign Affairs, War and Navy.

ART. 4.—Receiving stations must not cause annoyance of any kind to neighbouring stations, even in the case of receiving apparatus giving out waves of weak intensity from the aerial. Every precaution must also be taken to reduce to a minimum this emission of waves by the receiver.

ART. 5.—The Administration of Posts and Telegraphs is charged to exercise such control as it deems fit over private wireless receiving stations. Its inspectors may enter any premises where stations are installed for public performances.

ART. 6.—Wireless stations intended for public performances of the second category mentioned in Art. 2, are subject to an annual fee, indivisible and due from the 1st of January to 31st of December in each year. This fee is fixed at 200 francs. It is chargeable on each independent receiver.

ART. 7.—The establishment of private wireless stations employed for transmission or for the transmission and reception of signals and communications is subject to a special authorisation by the Under-Secretary of State for Posts and Telegraphs, upon the advice of an inter-ministerial committee constituted by the Under-Secretary of Posts and Telegraphs.

The Ministries of Foreign Affairs, Home Affairs War and Navy may oppose the establishment of any private wireless station liable to affect either the safety of the State or the normal working of wireless stations carrying out their services.

ART. 8.—Every wireless transmitting station not used by the State for official services or for public communication or by a concessionaire authorised to carry out services of a similar nature, is considered to be a *private wireless transmitting station*.

PRIVATE WIRELESS TRANSMITTING STATIONS are divided into five categories :—

- (1) Fixed stations intended for private communication only.
- (2) Fixed stations intended for broadcasting communication of general interest.
- (3) Movable stations and land stations corresponding with these stations for the interchange of communications of private interest, and not subject to the provisions of international conventions or internal regulations.
- (4) Stations intended for tests of a wireless technical nature or for scientific experiments.
- (5) Amateur stations.

ART. 9.—Information of all kind transmitted by private wireless transmitting stations is subject to the control already prescribed by Art. 3 of the Law of November 29th, 1850, regarding private telegraphic correspondence.

Stations of the second category may be used only for the transmission of artistic productions or educational lectures of an impersonal nature, and of information of general interest. All advertisement or publicity of any kind is forbidden.

Information other than that of a purely artistic, scientific or educational nature may only be transmitted if it is intended for publication in a newspaper or periodicals fulfilling the conditions of the Law of July 29th, 1881. The said publication does not relieve the personal responsibility of the licensee of the wireless transmitting station interested.

Financial and commercial market quotations may only be transmitted if they are extracts from documents published by qualified authorities.

Licensees of stations in the second category are obliged to keep a daily record of the transmissions made by their stations. This record must be forwarded on demand to the officers responsible for the control mentioned in Art. 14 hereunder.

Licensees of stations in the second category must transmit, free of charge, during one effective hour daily, information of official or general interest communicated to them by the Administration of Posts and Telegraphs.

Stations in the fourth category may only transmit signals and communications relating to adjustments at fixed dates and times, and by temporary right only.

Stations in the fifth category may only transmit communications relating to the working of their apparatus to the exclusion of all correspondence of special or personal character.

ART. 10.—Every application for leave to establish private wireless transmitting stations should be addressed to the Under-Secretary of Posts and Telegraphs.

It must be presented in the form of the schedule annexed to the present Decree (Schedule 2) in duplicate, one copy being on stamped paper.

It must indicate the object aimed at by the applicant, the nature of the communications proposed, the precise locality where the apparatus will be installed, the hours desired for operating the station, the proposed technical characteristics of the complete installation (form and dimensions of aerial, type of apparatus, total power measured by the input, *i.e.*, at that point in the installation where the electrical energy last appears in the form of direct or low-frequency alternating current before entering the high-frequency generators, type of wave, method of modulation, wavelength). It must

be accompanied by a scheme of the communication it is proposed to establish with the correspondents listed.

Authorisations will be granted only to holders of operators' certificates for radiotelegraphy or radiotelephony obtained after an examination the nature of which is determined by the Under-Secretary for Posts and Telegraphs, or to owners of installations who undertake to assure the observance of regulations and the proper working of their stations by an operator holding one of the required certificates.

The examination fees for these certificates are fixed at 15 francs for each candidate examined. A station in the second category may only be put into operation after certification by the Administrator of Posts and Telegraphs of the apparatus installed, and of its proper working under normal conditions. The number of transmitting stations in a given district may be limited on account of the possibility of interference between stations of the same nature.

ART. 11.—The only types of waves admissible for authorisation are as follows :—

Continuous Waves manipulated, Continuous waves modulated by speech or by musical sounds.

Notwithstanding, in stations of the third category, all type of wave allowed by the international regulations are admissible for authorisation for such services as may eventually prove of an international character.

ART. 12.—The power and wavelengths allowed for private wireless transmitting stations are to be within the following limits :—

(a) *Stations in the first category.*

Power proportionate to the range and limited to 400 watts input; wavelength 150 to 200 metres for telegraphy and telephony. In the exceptional case of a station in this category being licensed to establish communication within a congested area the power will be limited to 100 watts input and the wavelength between 125 and 150 metres; moreover the height of the aerial above the ground must not exceed 30 metres.

(b) *Stations in the second category.*

Power proportionate to the object of the transmission and limited to 1,500 watts input.

Wavelength :—200 to 280 metres for telegraphy, 200 to 230 metres for telephony, 350 to 425 metres for telephony.

Nevertheless, the Under-Secretary of State for Ports and Telegraphs, after agreement with the Ministers interested, may authorise, provisionally, the establishment of stations in the second category, having a power and wavelength not included in the limits stated above. Such authorisations are essentially of a temporary and uncertain character.

Where stations in the second category are intended solely for local transmissions, the power is limited to 100 watts input, and the wavelength to between 125 and 150 metres; also the height of the aerial above the ground must not exceed 30 metres.

(c) *Stations in the third category.*

Power proportionate to the range and limited to 400 watts input.

Wavelength, 150 to 180 metres.

Nevertheless, for stations required to maintain communications of an international character the wavelengths are fixed in accordance with the international regulations.

(d) *Stations in the fourth category.*

Power determined in each case. Wavelength according to the object in view.

(e) *Stations in the fifth category.*

Power limited to 100 watts input. Wave length 180 to 200 metres.

Subject to the limits indicated below, the technical characteristics of any private wireless transmitting station are determined by the interministerial committee, cited in Art. 7 of the present Decree, after examination of the documents furnished by the applicant stating the objects in view and taking into account the international regulations.

These technical characteristics remain always subject to restrictions which may become necessary on account of the requirements of public services.

ART. 13.—The following are forbidden:—

(1) All transmissions which are not in plain language and in French, except by special permission obtained and after notice from the interministerial committee cited in Art. 7.

(2) All transmissions effected by special processes which do not permit of the reception and comprehension of messages by means of receiving apparatus of a type approved by the Administration of Posts and Telegraphs.

ART. 14.—The Administration of Posts and Telegraphs exercises a permanent control over private wireless transmitting stations. The Inspectors of the Administration responsible for the control may enter the transmitting station.

ART. 15.—Private wireless transmitting stations in the five categories are subject to a control tax of 100 francs per annum and per kilowatt or fraction of a kilowatt measured by the input. This tax is due for the entire year at whatever date the station started working. Any extra expenses which may be occasioned by the special control of a private wireless station must be reimbursed by the licensee of the station.

ART. 16.—Stations in the first three categories, with the exception of spare transmitters, are also liable for fees for right of usage fixed for each transmitter as follows:—

Stations in the first and third categories : 40 francs per annum and per watt-input.

Stations in the second category : 20 francs per annum and per watt-input.

The total fee for right of usage applicable to the three categories of stations aforesaid is payable from the day on which the stations are opened. For the first year, however, it is calculated, proportionately to the period to run to December 31st; for succeeding years it is due to the State, for the whole year from January 1st.

For temporary stations whose duration is fixed by the terms of authorisation the amount of the fee for right of usage is calculated proportionately to this duration.

The fees for right of usage is reduced to one-third for stations in the first category established by undertakings for the distribution of power in virtue of the obligation imposed on them by laws, decrees and regulations, and if designed exclusively to maintain the safety of the undertaking.

ART. 17.—Private wireless transmitting or receiving stations of every nature must be established, operated and maintained by the licensees at their own risk and expense.

The State will not assume any responsibility on account of these operations.

The licensees must give a written undertaking to observe, without any reservations, all regulations already existing or to be made regarding the establishment and use of private wireless stations, as well as any special condition which may be imposed by the Administration of Posts and Telegraphs.

ART. 18.—In international wireless relations, the fees for right of usage are fixed after agreement with the foreign offices concerned.

ART. 19.—The authorisations granted carry no privilege, nor can they constitute any obstacle to similar authorisation which may subsequently be granted to any other applicant. They are issued without guarantee against mutual interference which may result from the simultaneous working of transmitting stations. They are not transferable to a third person. They are revocable at any moment, without indemnity, by the Under-Secretary of State for Posts and Telegraphs and notably in the following cases:—

(1) If the licensee does not observe the particular conditions imposed on him for the establishment and working of his station.

(2) If he infringes the national or international regulations regarding the working and exploiting of wireless stations.

(3) If he uses his station for purposes other than those provided for in his authorisation or declaration.

(4) If he violates the secrecy of communications which are not addressed to him and which he has intercepted. Such communication may only be disclosed to officials appointed by the Administration of Posts and Telegraphs or to authorised police officers.

(5) If he causes any trouble whatever to the working of public services by interference with either radiotelegraphy or radiotelephony, or with wired telephony of high or low frequency.

ART. 20.—Wireless stations, apparatus and installations may be seized by order of the Under-Secretary of State for Posts and Telegraphs, in all cases where their use compromises public order or safety or national defence, or interferes with wireless communications.

ART. 21.—All dispositions contrary to those of the present Decree, and notably Art. 4 of the Decree of May 15th, 1921 are and remain repealed.

ART. 22.—The President of the Council, Minister of Foreign Affairs, the Ministers of Public Works, of War, the Navy, the Interior and of Finance are charged each as far as he is concerned, with the execution of the present Decree, which will be published in the *Journal Officiel*, and inserted in the *Bulletin des Lois*.
Owing to public opposition, this Decree has not yet been promulgated.

DECREE DATED APRIL 6TH, 1923, RELATING TO WIRELESS TELEGRAPHY ON SHIPS.

N Extract from the *Journal Officiel* of the 8th April, 1923.

The President of the French Republic.

On the report of the Minister of Public Works.

In view of the Law of April 17th, 1907, concerning the security of maritime shipping and the working regulations on board commercial ships, and especially of Article 53, paragraphs 4 and 5, of the said Law reading as undernoted:—

ART. 53.—A public regulation of administration issued on the suggestion of the Minister of the Navy and the Minister of Commerce and Industry, after advice from the superior council of maritime shipping shall fix:

4th. The list of nautical instruments and all articles of outfit and spare parts which must be obligatory on all vessels, as well as the conditions which these various instruments or articles must satisfy in order to fulfil their purpose;

5th. The list of installations, small boats, salvage apparatus or machines which the vessel must possess for the purpose of ensuring collective or individual safety, as well as the ship's communications with the shore in case of accident.

In view of the Decree of September 21st, prescribing regulations of public administration for the application of the said Law of April 17th, 1907;

In view of the Decree of May 5th, 1919, prescribing the allocation to the Ministry of Public Works and Transport of all the services dependent on the Commissariat of maritime transport and also the mercantile marine;

In view of the Decree of June 5th, 1914, prescribing the institution of the superior council of the mercantile marine;

In view of the Decree of February 25th, 1919, relative to the organisation of the superior council of the mercantile marine;

In view of the Decree of July 19th, 1919, instituting a permanent section of the superior council of the mercantile marine;

In view of the advice of the permanent section of the superior council of the mercantile marine under date of June 16th, 1922;

The Council of State having heard this,
Decrees:—

ART. 1.—Independently of the provisions prescribed by the regulations of public administration as above described of September 21st, 1908, in the interests of the security of maritime shipping, the following dispositions are applicable as regards the installation and use of wireless telegraphy on board commercial or fishing boats.

ART. 2.—With a view to the security of maritime shipping, there must be installed:—

1. A station capable of transmitting and receiving radiotelegraphic signals on commercial and shipping vessels of a gross weight of 2,000 tons and over, or taking 50 or more persons on board (including the crew), or having more than 12 passengers on board.

2. A station capable of receiving radiotelegraphic signals on commercial and fishing vessels of a gross weight of 500 tons and less than 2,000 tons, taking less than 50 persons (including the crew), or having a maximum of 12 passengers on board.

3. Vessels provided for in the foregoing Article which may be allocated to special services or for short voyages, may be excepted from this obligation by the Minister in charge of the mercantile marine service and after advice from the superior commission instituted by Articles 18 and 19 of the Law of April 17th, 1907.

ART. 4.—Ships on which radiotelegraph stations, both transmitting and receiving, are compulsory in virtue of Article 2, are divided into three classes from the point of view of watch service.

In the 1st class are included: (a) ships fitted to carry 25 passengers or more on board:—

1. If they have an average service speed of 15 knots or more.

2. If, having an average speed greater than 13 knots, they have on board 200 persons or more (passengers and crew), and if during the course of their voyage they traverse a distance of 500 miles between two consecutive ports of call.

In the 2nd class are included: (b) ships fitted to carry 25 passengers or more on board, if not included for other reasons in the first category.

In the 3rd class are included: (c) all other vessels on which a wireless telegraph station is

obligatory, in accordance with Clause 1 of Article 2.

ART. 5.—The watch on vessels of the 1st class must be continuous.

On vessels of the 2nd class, watch must be kept at the times fixed either in Table 1 or Table 2, annexed to the present Decree, in accordance with the instructions given by the inspector of maritime shipping dependent upon the nature and length of the voyage.

On vessels of the 3rd class no fixed time for keeping watch is specified.

ART. 6.—The service of a station which is both transmitting and receiving shall be assured by the employment of a licensed operator, a holder of one of the certificates provided for in Article 10 of the regulations annexed to the International Radiotelegraph Convention of July 5th, 1912.

Besides this operator, there shall be an operator or licensed listener on vessels of the (b) class and two operators or licensed listeners on vessels of class (a).

These operators or supplementary listeners shall not be required in the event of the inspector of maritime shipping considering that, by reason of the nature and length of the voyage, the conditions under which the watch must be guaranteed according to the terms of Article 5 render their presence unnecessary.

On vessels where a receiving station only is compulsory, by virtue of Article 2, paragraph 2, the service of this station must be assured by the employment of one or more licensed listeners.

ART. 7.—Ship radiotelegraph stations must be able to transmit by day, from ship to ship, signals which are clearly readable under normal atmospheric conditions at a distance of at least 150 nautical miles without amplifier.

Stations or sets must be able to receive all wavelengths up to 2,800 metres on both the "stand by" and the "tuned" circuits.

ART. 8.—Transmitting and receiving radio telegraph stations must comprise a normal installation and an auxiliary installation.

Each installation must include a special chronometer and a watch measuring seconds.

The captain's bridge and the wireless cabin shall be directly connected by a speaking tube, telephone or any other method of communication.

The radiotelegraphist on watch must not leave the operating cabin.

ART. 10.—The auxiliary installation must be erected wholly above the water line. It must possess its own source of energy, which can be rapidly started and can work for at least six hours. It must have a minimum range of 80 nautical miles for vessels of the first class and 50 nautical miles for vessels of the two other classes.

The use of accumulators as a source of energy of the auxiliary installation is authorised.

If, irrespective of the conditions stipulated in the foregoing Articles, the normal installation likewise fulfils all the conditions mentioned in the present Article respecting the auxiliary installation, the latter is not compulsory.

ART. 11.—Any captain of a vessel who receives a call for assistance from a vessel in distress is bound to go to the assistance of the shipwrecked vessel.

Every captain of a vessel in distress has the right to choose from among the boats who have answered his call the one or more he judges the most capable of rendering assistance. He should not exercise this right until after having, as far as possible, made inquiries from the captains of these boats. The latter must

immediately proceed at full speed to the assistance of the shipwrecked vessel.

The captains of vessels under the obligation of rendering assistance are freed therefrom directly the captain or captains summoned have announced that they will comply with the appeal, or when the captain of one of the boats which has reached the place where the disaster is informs them that their assistance is no longer necessary.

If the captain of a boat finds it impossible or does not consider that, according to the special circumstances of the case, it is reasonable or necessary to go to the assistance of the vessel in distress, he immediately advises the captain of the latter to this effect. He must likewise enter in his ship's log the reasons justifying this decision.

ART. 12.—A trial of the wireless apparatus will be made before each voyage under the supervision of the inspector of maritime shipping, in order to test the working of the apparatus. A note will be entered in the ship's log and in the wireless log, of the inspection made previous to sailing.

ART. 13.—At the time of inspection before sailing the inspector of maritime shipping will satisfy himself that each vessel, taking into

account the class to which it belongs by virtue of the present Decree, fulfils all the obligations incumbent on it.

A note of this inspection will be entered in the log.

The inspector of maritime shipping may prohibit the sailing of any ship which does not fulfil its obligations.

ART. 14.—A period of six months in which to comply with the provisions of Article 2 is allowed for vessels mentioned in Article 2 which may not yet have wireless apparatus installed as prescribed above.

ART. 15.—Radiotelegraphic apparatus installed on fishing vessels after the publication of this Decree must always be placed in the upper part of the vessel.

ART. 16.—The Minister of Public Works is entrusted with the carrying into effect of the present Decree which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

Given at Rambouillet, April 6th, 1923.

A. MILLERAND.

By the President of the Republic:

The Minister of Public Works,

YVES LE TROQUER.

GAMBIA

(See Maps 24 and 26)

ADMINISTRATION.

THE rules governing the working of wireless telegraphy in this Colony were originally instituted under the Ordinance (Maintenance of Control) of 12th February, 1903. This has now been repealed and the ruling Ordinance is that of the 22nd of September, 1913, entitled "An Ordinance to provide for the Regulations of Telegraphs." The text will be found below.

A—Ordinance, September 22nd, 1913.

B—Schedule.

C—Rules under 1913 Ordinance.

A I. This Ordinance may be cited as "The Telegraphs Ordinance, 1913."

II. The words "telegraphy" and "telegraph" mean any system used for conveying transmitting or distributing electricity or any like agent for the purpose of communication from one point to another.

The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

III. The Governor may, whenever he shall deem it expedient to do so, licence the establishment of any telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony.

IV. (1) No person shall establish any telegraph station, or install or work any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony except under, and in accordance with, a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period, as the Governor in Council may determine and shall contain such terms, conditions and restrictions on any subject to which the licence is granted as the Governor shall consider desirable in the public interest.

V. (1) If any person establishes a telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for telegraphy installed or worked without a licence; but no proceedings shall be taken against any person under this section except with the sanction of the Legal Adviser to the Governor.

(2) If the Chief Magistrate, the Police Magistrate, or a Justice of the Peace is satisfied by information on oath that there is a reasonable ground for believing that a telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any part or on board any ship within the

jurisdiction without a licence in that behalf, he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used, or intended to be used, for telegraphy therein.

VI. (1) The Governor in Council may amend, vary or revoke any of the regulations contained in the Schedule to this Ordinance, and may make regulations for all or any of the following matters:—

(i) Prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) Prescribing the fees payable on the grant of any licence;

(iii) Prohibiting or regulating the use of telegraphy in such telegraph stations, or of wireless telegraphy on board such ships while in such waters, by such further rules as the Governor-in-Council may see fit to make from time to time, and either in all cases or in such cases as may be deemed desirable, if at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over telegraph stations or over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony.

(2) Provided that no regulations made in respect of the provisions in this section contained shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

VII. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for the purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

VIII. (1) Every omission or neglect to comply with, and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder, or in breach of the conditions and restrictions subject to, or upon, which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding fifty pounds or to imprisonment with or without hard labour for a term not exceeding six months.

(2) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a Court of Petty Sessions.

IX. Nothing in this Ordinance contained shall invalidate or impair any agreement now in force entered into between the Governor of this Colony, or the Imperial Government on behalf of the Government of this Colony, and any telegraph company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance and use thereof, or to the payment of any subsidy to such company by the Government of this Colony or any other the like matter.

X. Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

XI. The Telegraphic Establishments (Maintenance of Control) Ordinance 1903 is hereby repealed. * * *

To this Ordinance is attached a Schedule which runs:—

THE SCHEDULE.

B 1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the territorial waters of the Colony shall be worked in such a way as not to interfere with (a) naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, or in the Protectorate, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, shall be worked or used whilst such ship is in any of the harbours of the Colony or Protectorate except with the special or general permission of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress. * * *

It will be noted that under Section VI of this Ordinance the Governor-in-Council has power to make regulations. Of those which His Excellency has accordingly promulgated under date of the 28th January, 1914, the text runs as follows:—

RULES MADE BY THE GOVERNOR-IN-COUNCIL UNDER SECTION VI OF THE TELEGRAPH ORDINANCE, 1913.

C 1. These rules may be cited for all purposes as "The Telegraph Rules, 1914."

2. The expression "the Company" shall mean any company, corporation or person for the time being engaged in the Colony or Protectorate of the Gambia in transmitting or receiving telegrams.

3. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony and Protectorate of the Gambia shall have control over the transmission of telegrams by the Company, it shall be lawful for the Governor by warrant under his hand to direct and authorise such persons as he may think fit to assume the control of the transmission of telegrams by the Company either wholly or partly and in such manner as he may direct, and such persons may enter upon the Company's premises accordingly or the Governor may direct the Company to submit to him or any person authorised by him all telegrams tendered for transmission or received by the Company or any class or classes of such telegrams, and to stop or delay the transmission of any telegrams or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of telegrams as the Governor may prescribe, and the Company shall obey and conform to all such directions.

Provided always that if default shall be made by the Company in the observance or performance of any provision hereinbefore contained it shall be lawful for the Governor by warrant under his hand to direct and cause so

much of the Company's works as are in the Colony or Protectorate of the Gambia or any part of such works to be taken possession of for such services as to the Governor may seem fit, and in that event any person authorised by the Governor may enter upon the offices and works of the Company or any of them and take possession thereof and use the same as aforesaid. Nothing herein contained shall be deemed in any way to prejudice or abridge the power of the Government of the Colony and Protectorate of the Gambia to take possession under or by virtue of any agreement for the time being in force.

4. In any such case as aforesaid if the Company show that during the exercise of any of the powers aforesaid their receipts from the telegraphs with respect to which the said powers have been exercised have been less than their receipts from the same source during a corresponding period on the average of the last three years preceding the Government of the Colony and Protectorate of the Gambia shall pay to the Company as compensation for any loss of profit sustained by the Company by reason of the exercise by the Governor of any of the powers hereby reserved such sum as may be settled between the Governor and the Company by agreement

or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Governor are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and save with the consent of the Governor no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing indirect suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

5. In estimating such compensation as in the preceding section provided the Arbitrator shall take into account all the circumstances of the case, including not only any such loss as aforesaid but also any additional profit accruing to the Company from the emergency which gave rise to the exercise of the powers aforesaid, and as regards the telegraphs with respect to which the said powers have been exercised the receipts of the Company on the average of the last preceding three years during a period corresponding to that of the exercise of the said powers shall be deemed to be the receipts which the Company would have taken during the period of the exercise of the said powers had the powers not been exercised.

GEORGIA

(See Maps 3 and 12.)

THIS Republic has only recently gained its independence, and lies in the mountainous region of the Caucasus. It possesses in Batum its outlet to the world through the Black Sea.

CONTROL.

Wireless Telegraphy constitutes a State monopoly, and is under the control of the War Office.

ORGANISATION.

The first wireless station on Georgian territory was erected during the war in 1914 for the use of the Caucasian Army which was fighting on the Turkish front. The following stations are those now existing: Tiflis, Batum, and Poti.

At the present time there is a very powerful station at Tiflis which was improved by the Italians. The Director of this station is Prince A. Andronikashvili and there are six other officials.

During the last months of 1920 the Georgian Government concluded an agreement with some French companies to erect four wireless stations in various parts of Georgia; these new stations will connect Georgia with large European centres, such as Paris, London, Rome, Moscow, etc. The central wireless station will be erected in Tiflis.

No other classes of wireless stations exist, but Government stations are used for commercial purposes and also for communicating with aircraft.

The Tiflis Wireless Station receives and despatches messages to and from Moscow, Basra and Constantinople, thereby acting as a relay station between these points.

ADMINISTRATION.

No special laws exist yet, although they are now receiving consideration.

GERMANY

(See Maps 2 and 8.)

Including : The States of Anhalt, Baden, Bavaria, Bremen, Brunswick, Hamburg, Hesse, Lippe, Lübeck, Mecklenburg-Schwerin, Mecklenburg-Strelitz, Oldenburg, Prussia, Saxony, Schaumburg-Lippe, Thuringia, Waldeck, Wurtemberg.

THIS republic was founded on November 9th, 1918, with a President at its head, from the then existing German Empire.

CONTROL.

In Germany, wireless telegraphy, like ordinary line telegraphy and the telephone system, is a monopoly of the State. The exercise of the monopoly is entrusted to the Imperial Postal Administration, within whose purview is also included the management of the entire postal system. The Imperial Postmaster-General is at the head of the Imperial Postal Administration. The Departments II, IIa, V and Va in the Imperial Postal Administration are charged with the direction of line, telephone and wireless matters. The direction of these departments, and consequently of the entire telegraph, telephone and wireless system, is placed in the hands of the Secretary of State. Of these departments the Department V attends exclusively to matters relating to the wireless telegraphic system, and this department directs particularly the fundamental questions of equipment, administration, communication and management. The technical matters in wireless telegraphy and the construction and working of wireless telegraphy installations, belong to the business side of the Wireless Department (IV) of the Imperial Telegraphs Technical Department,, which is directly under the Imperial Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Höfl	Minister of Posts	Berlin.
Dr. Engineer h.c. Hans Bredow ..	Secretary of State	Berlin.

The wireless traffic of Germany is organised as follows :—

I. WORLD TRAFFIC.

Wireless traffic with overseas countries is carried on by the long range stations of Nauen and Eilvese, which stations make possible general public communication with the United States of America (central radio corresponding stations, Rocky Point, Marion, New Brunswick and Tuckerton) and beyond (Central and South America, Asia and Australia), whilst the forwarding of press telegrams to these countries falls on the long range station of Eilvese alone. The chief wireless station of Königs Wusterhausen (near Berlin) is used generally for traffic with European countries, and makes possible traffic with :—

- Great Britain (corresponding station, London).
- Hungary (corresponding station, Buda Pesth).
- Bulgaria (corresponding station, Sofia).
- Serb,Croat,and
- Slovene (corresponding station, Sarajevo).
- Lettonia (corresponding station, Riga).

Communication with Italy (corresponding station, Coltano), with Roumania (corresponding stations, Bukarest and Oradeamare), with Russia (corresponding station, Moscow) and with Spain (corresponding stations, Aranjuez and Barcelona) is carried out by Nauen, and traffic with Egypt (corresponding station, Abu Zabal) is dealt with by Eilvese.

Traffic with the Netherlands (corresponding station, Rotterdam) is conducted through the wireless station at Dortmund.

The large wireless station at Nauen is the property of the limited liability company, "Drahtloser Uebersee-Verkehr" (Transradio); the large wireless station at Eilvese is the property of the Eilvese G.m.b.H., and both the wireless stations are, under superintendence of the State, worked by the limited liability company, "Drahtloser Uebersee-Verkehr" (Transradio). Königs Wusterhausen is the property of the Imperial Telegraphs Administration, and is worked by it. It is worked in accordance with the rules laid down by the International Telegraphs Agreement and the present executive arrangement, but telegraphed postal orders are not conveyed by wireless. For communication with European countries the rates for transmission by wireless and by ordinary telegraphy are the same. The German Telegraphs Administration therefore reserves itself full choice, as a rule, of the method to be adopted (wireless or wired telegraphy) for clearing traffic with these countries. If, however, the sender of the telegram is afraid of unauthorised persons listening, which, owing to the peculiarities of wireless telegraphy, is not entirely impossible, and therefore expressly desires the message to be forwarded on the wires, he must write in the space provided on the telegraph form for the route the word "fil," in accordance with the resolution of the European Communications Conference held at Paris in July, 1920.

For overseas traffic the rates for wireless are lower than those for cabled telegraphy; the route to be followed must therefore be shown by the sender.

The high-power wireless station of Nauen possesses, in addition to a musical note transmitter, high frequency machines of the system of Count Arco; Eilvese is fitted with high frequency machines of the Goldschmidt system; Königs Wusterhausen has undamped apparatus including a 32 kW and a 10 kW Lorenz transmitter (Poulsen arc) and a 10 kW valve transmitter.

2. SHIP TRAFFIC.

For the purposes of traffic with ships at sea, 23 coastal stations are at present in operation. They are as follows:—

- (a) Open for public service: Cuxhaven, Friedrichsort, Heligoland, Norddeich and Swinemünde.
- (b) For restricted public service: Arngast Leuchtturm, Borkum L.S. (Funkenstelle-wireless station), Bremerhaven Lloydhalle, Bülk L.S., List L.S., Nordholz L.S., Pillau L.S., Sassnitz, Wilhelmshaven 3rd Entrance L.S., and the light ships *Adlergrund*, *Amrunbank*, *Aussenjade*, *Borkum Riff*, *Eider*, *Eiderlotsengaliote*, *Elbe Eins*, *Fehmarnbelt*, *Kalkgrund*, *Kiel* and *Weser*.
- (c) For Naval service traffic only: Stolpmünde L.S. and Warnemünde L.S.

Of German ships 683 vessels are at present fitted with wireless stations, namely, 554 merchant ships and 129 naval vessels.

The working of the coastal and ship stations, as well as that of ship stations between themselves, is performed in accordance with the provisions of the International Radiotelegraph Convention (London, 5th July, 1912), and the Service Regulations annexed thereto, as well as the instructions regarding the Radiotelegraphic Service of the 15th June, 1913, which was issued for Germany in accordance with the provisions of the International Convention.

Ship radiotelegraph stations may only be installed and worked on German ships with the approval of the State.

3. IMPERIAL WIRELESS SERVICE.

The Imperial Wireless system in course of construction is to be used for inland wireless traffic. It is destined to supplement and relieve the interior telegraph system, and consists at present of the head wireless station at Berlin and the leading district wireless stations of Dortmund, Frankfurt-on-Main, Hamburg, Hannover, Königsberg (Prussia), Leipsig, München (Munich) and Stuttgart, and the wireless stations of Bremen, Breslau, Darmstadt, Dresden, Elbing, Erfurt, Konstanz, Liegnitz, Oppeln and Stettin. The leading wireless station of Dortmund also handles traffic with Rotterdam.

The principal wireless stations and the wireless stations at Breslau, Dresden, Elbing and Erfurt, communicate direct with the chief wireless station in Berlin. Besides this there are the following wireless connections, namely: Leipzig-Darmstadt, Constance-Frankfort a/M, Bremen-Hanover and Stettin-Hamburg.

The Imperial wireless system has also recently been utilised for the transmission of a new sort of telegraphic messages requiring a quite specially rapid delivery—the so-called “lightning wireless telegrams.” By means of these telegrams, the time which elapses between the handing in of the message and its delivery to the addressee is confined within the utmost limits. In order to attain this aim the greatest length of such a telegram has been fixed at 30 words. The telegrams are transmitted by the operator of the receiving office by telephone, or are handed over the counter of the corresponding telegraphic office, from whence, until they reach their destination, the messages are transmitted almost exclusively by wireless telegraphy, and they are conveyed to the addressee at the point of destination by means of the telephone. All the principal and ordinary wireless stations of the State wireless system take part in the lightning wireless service. In addition to the latter, there are a considerable number of other important places included in this traffic, the lightning wireless telegrams being forwarded from and to these places by the nearest principal or ordinary wireless stations, which are connected with the said places by short telegraph lines (connecting wires). At the present time there are altogether about 250 places taking part in this service.

For the purposes of transmission only valve transmitters are used, and owing to their great sharpness of tuning, a fairly close disposition of the transmission wavelengths is possible. For the Imperial wireless network the wavelengths used are between 1,000 and 3,000 metres, with the exception of some of the lesser ones, which are reserved for international sea traffic, and naval and air purposes.

The exchange of wireless telegrams is in recent times effected mainly by duplex working.

The publication of the chief district wireless stations (*Leitfunkstellen*) and ordinary wireless stations (*Funkstellen*) in the “*Nomenclature Officielle des stations radiotélégraphiques*,” etc., has not been effected.

4. CIRCULAR (*i.e.*, Broadcasted) WIRELESS NEWS.

(a) *Circular Wireless Service*.—For the reception of circular wireless news there exists at present a system of 75 official circular wireless receiving stations. The news received for publication is transmitted by wireless telegraphy to the circular wireless receiving stations, and are conveyed to the interested parties either by telephone or by means of messengers.

(b) *European Radio Service*.—A similar circular wireless service was introduced a short time ago by way of experiment under the name of “*Europadio*.” The financial news received for distribution by means of this service is transmitted by the *Eildienst G.m.b.H.* At the present moment the transmission of the message is made through the large wireless station at Nauen. Austria, Hungary, Norway and Czechoslovakia participate in the reception of the news, and the extension of the service to a number of other countries is in contemplation.

The news under (c) and (d) is delivered by the “*Transocean G.m.b.H.*”

(c) *European Press Service*.—The *Eilvese* high power station broadcasts twice daily, namely at 11 a.m. and 8 p.m. (Central European time), press news intended for reception in European countries. At 11 o'clock 400 words are transmitted in German and 200 words in Spanish, and at 8 o'clock 400 words are transmitted in German.

(d) *Overseas Press Service*.—From the Nauen high power station some 500 words of press news are broadcast daily and are intended for reception in overseas countries. The transmission is effected in two parts of 250 words

each, the first part for instance being transmitted at 12.20 p.m. (Central European time), and the second part at 12.20 a.m. (Central European time). At the conclusion of the second part both parts are repeated.

5. SPECIAL TRAFFIC.

(a) *Radio Direction Finding Service.*

(See Direction Finding Section)

(b) *Time Signal Service.*

(See Meteorological, etc., Section)

(c) *Radio Meteorological Service.*

(See Meteorological, etc., Section)

ADMINISTRATION.

For some time past licences have also been granted for the erection and working of private wireless installations in which are included "Experimental installations for sending and receiving," "Experimental installations for receiving," "Installations for the reception of the Nauen time signal" and "Wireless Working installations (Sending and Receiving installations) for overland power stations, water works, etc." The special circumstances of each case are considered in determining the conditions under which the licences are granted.

The conditions upon which such approval is dependent for the installation and working of a ship's wireless station are shown below. They correspond with a portion of "Anweisung für den Funkentelegraphendienst."

With regard to the division of ship stations (Article XIII of the Service Regulations annexed to the International Radiotelegraph Convention) into categories, the following provisions apply in Germany :—

(1) To the 1st Category (stations with continuous service) : belong the wireless stations—

(a) On all passenger steamers in the Transatlantic service to America.

(b) On all passenger steamers with a gross carrying capacity of not less than 6,000 tons and a speed of not less than 14 knots.

(c) On all passenger steamers (with the exception of those included under (a) and (b), having on board 1,000 or more persons (without crew and deck passengers).

(2) In the second category (stations with restricted working hours) will be comprised : the ship stations on all other passenger vessels not included from 1a to c.

(3) In the third category (stations without fixed working hours) will be included : the ship stations on all cargo stations.

The carrying out of the wireless service on ships is regulated in the following manner :—

(1) Ships having a wireless station of the 1st Category must have on board at least two first class telegraphists.

(2) Ships having a wireless station of the 2nd Category must have one telegraphist of the 1st Class and at least a second man who is competent to maintain listening service for the first ten minutes of each hour outside the regular hours of service.

(3) Ships having a wireless station of the 3rd Category must have one telegraphist of the 2nd Class.

New regulations having as their object the regulating equipment of ships with wireless apparatus and their manipulation by wireless telegraphists in accordance with the International Convention for the safety of human life at sea, are in course of preparation.

The use of telegraph installations on foreign vessels for navigation at sea and for inland navigation, within German territorial waters, is regulated on the basis of paragraph 3b of the Telegraph Law of the 6.4.92/7.3.08, by the provisions set forth below.

The present Wireless Laws and Regulations appear in accordance with the following list :—

- A**—Telegraph Law of the German Empire, March 7th, 1908.
- B**—Regulations (Foreign Ships).
- C**—Conditions of Concession (Ship Stations).
- D**—License for Aeroplane Wireless Installations.
- E**—Conditions for the Installing and Working of Wireless Stations for Experimental Purposes,
- F**—Conditions for Experimental Wireless Receiving Installations.
- G**—Conditions for Wireless Receiving Installation for the reception of NAUEN time signals.
- H**—Conditions for the Erection and Working of Wireless Stations (Transmitting and Receiving Stations) for Overland Power Stations, Waterworks, etc.

A *Sole Article.*—The Act of April 6th, 1892, relating to telegraphs in the German Empire is modified as follows :
1. Article 3 is completed by the following paragraph (2) :—

Installation of electric telegraphs for transmission of messages without the aid of metallic wires of junction shall not be established and worked except with the authorisation of the State.

2. The following provisions are inserted after Article 3 :—

(3a) Telegraphic installations which are not exclusively designed for the internal service of a ship cannot be established and worked on German vessels unless authorised by the State.

(3b) The Imperial Chancellor shall decree the regulations concerning the working of telegraph stations on board foreign vessels in German territorial waters.

3. Article 7 is completed by the following paragraph (2) :—

The provision of Paragraph 1, Phrase 1, does not apply till July 1st, 1913, to installations of the nature defined in Article 3, Paragraph 2.

B The following regulations are decreed for the working of telegraphic installations on board foreign ships in German territorial waters, and are founded on Article 3 (b) of the "Telegraph Law of the German Empire," of April 6th, 1892, and March 7th, 1908, and under the reservation of Article 15 of this law :—

1. Ships of war are authorised, in a general manner—

(a) To exchange messages, signals, by means of optic and acoustic signals, submarine acoustic signalling excepted.

(b) To use wireless telegraphy, on condition that they do not disturb the radiotelegraphic service of the public coast stations, or the service of the coast or ship stations of the Imperial Navy.

In exchanging messages with German or foreign radiotelegraphic stations, foreign vessels must conform to the regulations of the "Decree for the Regulation of the Radiotelegraphic Service" and to the Decrees which may ultimately be promulgated.

2. Foreign vessels other than ships of war are authorised—till otherwise decreed—

(a) To exchange messages by means of optic and acoustic signals, submarine acoustic signalling excepted, and under the reservation that within the illumination zone of the navigable waters of the German

coasts and islands the lights of the signal protectors or lanterns must not exceed that prescribed for fixed lights.

(b) To use wireless telegraphy in conformity with the provisions of the "Decree Regulating the Radiotelegraphic Service" and the decrees which may ultimately be promulgated; nevertheless, in the ports, roadsteads, and estuaries, and in the navigable waterways of the interior, wireless telegraphy can only be used on an authorisation being granted in writing by the Ministry of Posts and Telegraphs of the German Empire.

3. In the public interest the Articles 1 and 2 may be temporarily restricted or suspended.

4. Whosoever works telegraphic installations in a way not authorised by the preceding provisions is liable to fines determined in Article 9 of the "Law of Telegraphs," and in virtue of Article 40 of the Penal Code of the German Empire all the apparatus designed for the transmission of wireless messages can be confiscated. Moreover, installations which have been worked without a licence can be, in conformity with Article 11 of the "Telegraph Law," removed or rendered unserviceable.

C The following are some of the principal conditions on which the concessions for the installation and working of a radiotelegraph station on board ship is granted :—

1. The concession for the installation and working of the ship station may be withdrawn at any time.

2. The station must fulfil the following requirements :—

(a) The construction of the station must be in accordance with modern developments of science and technology.

(b) The ship station must be equipped in such a way as to be able to use the two wavelengths of 600 and 300 metres.

(c) The waves must be as pure and little damped as possible. The use of sending arrangements with which the production of the emitted waves takes place by direct sparking discharges of the antenna is not permitted, except in cases of distress. However, it may be allowed for certain special stations—e.g., for such on small ships—the primary energy of which does not exceed 50 watts.

(d) The power transmitted by the radiotelegraphic apparatus, measured at the terminals of the generator, must not under normal conditions exceed one kilowatt.

(e) With the reservation of the special provision concerning the application of the 1,800 m. wave, a power of more than one kilowatt may be used if the ship must maintain communication over a distance exceeding 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be maintained except by means of an increase of power.

(f) The apparatus must be suitable for transmitting and receiving at a speed of at least 20 words per minute, five letters being counted as one word. Installations working with more than 50 watts must be equipped so as to be able to cover several distances within the normal range of transmission, the shortest of which shall be about 15 nautical miles.

(g) The receiving apparatus must be capable of reception up to 600 miles with the greatest possible protection against disturbances.

3. Ships belonging to the first two categories stated under Article 8, in addition to the ordinary apparatus, must be equipped with emergency gear having an independent source of power and capable of working for at least six hours, with a minimum range of 80 nautical miles in the case of ships in the first category, and of 50 nautical miles of those of the second category. The emergency gear is not necessary in the case of ships whose ordinary plant fulfils the conditions for emergency sets.

The emergency gear, as well as the ship stations themselves, must be placed as high as possible above the deck—viz., according to the structure of the ship and the available space, either equal to the height of the bridge or of the large boat deck, so that in case of accident they shall be able to remain longest above the water. When using batteries for the emergency plants accumulators may be arranged in the station room itself, whilst acid accumulators, on account of the vapours which they develop, must be placed outside the station room, but in its immediate vicinity and so that they are protected against outside influences.

4. The contractor must submit to the Imperial Telegraph Administration a description of the ship station, together with a plan of the circuits. Subsequent alterations of the technical equipment affecting transmission or reception must not be made without the consent of the Imperial Telegraph Administration.

5. In order to examine the prescribed arrangement of the ship's station, and the carrying out of the service, the officers of the Imperial Telegraph Administration are permitted at any time to enter the rooms where the apparatus is installed, and to inspect the working equipments.

6. The radiotelegraph service on the ship must be operated only by German subjects.

7. The service of the ship station must be carried out by an operator holding a certificate issued by the Imperial Telegraph Administration, or in an emergency, and for one journey only, by another Government which is a party to the International Radiotelegraphic Convention.

There are two classes of certificates.

The first-class certificate for the capability of the operator, with regard to:—

(a) The adjustment of the apparatus and knowledge of the methods of working.

(b) Transmitting of telegrams and receiving by sound at a speed of at least 20 words per minute.

(c) Knowledge of the regulations applying to the exchange of radiotelegraphic communication.

The second-class certificate may be issued to an operator who attains in transmitting and receiving a speed of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Operators holding a second-class certificate may be admitted:—

(a) On ships which use radiotelegraphy for their own service only and for the exchange of messages of the crew, in particular on fishing vessels.

(b) On all ships as junior operators, provided that such ships have on board at least one operator holding the first-class certificate. Nevertheless on ships placed in the first category mentioned in Article 8 the service must be carried on by at least two operators holding the first-class certificate.

Transmission may be made only by an operator holding either the first or second class certificate, except in cases of emergency.

8. Ship stations are placed in three categories:

- (1) Stations always open.
- (2) Stations having limited working hours.
- (3) Stations having no fixed working hours.

During navigation the following must remain permanently on the watch:—

- (1) The stations of the first category.
- (2) Those of the second category during the hours that they are open for service; out of these hours these stations must remain on the watch for the first ten minutes of each hour.

The stations of the third category are not bound to perform any regular "listening" service.

9. The ship station operator is under the supreme authority of the captain or of the captain's representative, who, in his capacity as superintendent of the ship station, is entitled to note the contents of all telegrams provided he has been placed by the Imperial Telegraph Administration, or, in the case of ships that are permanently abroad, by a German Consulate (General or Vice-consulate), under the obligation of preserving the secrecy of correspondence.

10. The certificate may be withdrawn if, in the case of any offences against the "Regulations for the Radiotelegraph Service," the operator has been found guilty after an inquiry.

11. If it is shown that the offence is due to the condition of the apparatus or to instructions given to the operator, the same procedure will be followed in respect of the licence issued to the ship.

12. The certificate may also be withdrawn if it is stated by an officer of the Imperial Telegraph Administration that the operator is no more in possession of the prescribed knowledge and skill. In the latter case a certificate will be granted to the operator after he has successfully passed a further examination.

13. Every change in the staff of the ship station must be reported immediately to the local post office of the home port.

14. The ship station is bound to interchange radiotelegrams with every coast station and with every other ship station, without regard to the particular system of radiotelegraphy employed.

15. The Radiotelegraph Service is regulated in accordance with the rules in the "Instructions for the Radiotelegraph Service." In addition, special instructions which may be issued by the Imperial Telegraph Administration must be observed also.

22. The ship station must be in possession of the certificate from the Imperial Telegraph Administration, stating that the installation and the working of the station have been licensed by the authority named and the category in which the station is placed. This certificate must be kept in the station and presented upon the request of the authorities of the countries at the ports at which the ship calls.

23. If _____ transfers the service of the ship wireless station to a contractor it is incumbent on _____ that the conditions laid down are fulfilled by the contractor.

Place
Date

(Signature)

CONDITIONS FOR THE FITTING AND WORKING OF WIRELESS INSTALLATIONS ON AEROPLANES.

D 1. The licence for the installation and working of the wireless plant on is granted on the understanding that it may be revoked. The transfer of the licence to other parties is prohibited.

2. The plant must, as a rule, only work in connection with the nearest wireless installation intended for the air-service for the exchange of news which concern the working and the safety of aircraft. The transmission of other news is not permitted, whether paid for or gratuitously. In the case of need the aircraft is permitted to get into communication with other wireless stations. In such an event the generalemergency signal •••—••• must be used.

3. In sending messages only such energy must be used as is absolutely necessary for giving effect to the object in view.

4. The plant must only be worked by the use of a definitely prescribed wave. This wave must be undamped and as sharply tuned as is practicable in the present state of wireless technology. The waves of 300, 450 and 600 metres reserved for purposes of general communication may only be employed in cases of emergency.

5. Transmission limitations and circular working regulations (for example, wave distribution, call signals, apportionment of time, etc.) are given in a separate appendix, and are to be adhered to with exactitude.

6. General public communication as well as the working of the wireless stations of the army and of the navy must not be interfered with.

7. A notice regarding the terms of working of the installed plant is attached to the licence contract, and is to be observed by the owner of the plant. The plant may be only erected and worked in accordance with the terms of this notice. Any departures from the terms of the notice require the consent of the Ministry of Posts and Telegraphs of the State.

8. For purposes of superintendence the official appointed by the Imperial Telegraph Administration is to be permitted to inspect the aircraft at the landing places, and to satisfy himself as to the arrangements made for giving effect to the wireless working.

9. The owner of the plant is unreservedly obliged, under full responsibility, to see that any messages received by the plant from other wireless installations are kept secret under all circumstances, and no use made of them.

10. The owner of the plant is responsible for any damage which may result from the working of the plant in the measure of the legal enactments appertaining to the subject. He is also responsible for the safeguarding of the plant, and for preventing its use by unauthorised persons.

11. Immediate compliance with the demand of the Telegraph Administration of the State, as well as that of its authorised officials, for temporary suspension for working the plant, is stipulated. In this connection the working arrangements (apparatus, antennæ, etc.), or any portion of them, are to be so dealt with during this period that use of the plant is made impossible. The decision in this matter is in the province of the Telegraph Administration of the State.

12. The owner of the plant undertakes to pay an annual fee of _____ m. to the Administration of the Posts and Telegraphs of the State.

13. Amplification or amendment of the conditions set forth above is expressly reserved. The owner of the plant is under obligation to give effect without delay and at his own charges, to any further condition laid down by the Telegraph Administration of the State.

14. The holder of the licence as a guarantee that he will observe the licence conditions, has to deposit an amount of m. with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

Accepted _____ of _____ 19____
the _____ Signed _____

CONDITIONS FOR THE INSTALLING AND WORKING OF WIRELESS STATIONS FOR EXPERIMENTAL PURPOSES.

E The licence for the erection and for the working of the wireless plant is granted on the understanding that it may be revoked. The transfer of the licence to third parties is prohibited.

2. The deed of licence is a notice attested by the Imperial Postal Administration regarding the terms of working of the installed plant, such notice being acquiesced in by the owner of the plant by act of signature. The plant may only be erected and worked in accordance with the terms of this notice. Departures from the terms of the working instructions must first be approved by the Imperial Postal Administration.

3. In so far as the obtaining of the necessary consent of the authorities responsible for the upkeep of roads and of the owners of other parties interested in the surfaces crossed or used in passing over public roads and places with antennæ wires or in the erection of supporting posts on private ground is concerned, this is a matter which lies entirely with the owner of the plant.

4. The plant may only be used for carrying out wireless experiments and for the reception of the information serving the purpose of such experiments. The transmission of other news from other wireless stations, with the exception

of the news marked "For all," is forbidden. Wireless communications intended for others and which may unintentionally come through must neither be written down, nor communicated, nor made use of in any way. The owner must, with this end in view, take steps to have his wireless plant safeguarded, and to prevent its being used by unauthorised persons.

5. Only so much electrical energy must be used in transmission as may be absolutely necessary for giving effect to the object in view. The waves must be tuned as sharply as may be found possible in the present state of wireless technology.

6. The telegraph and telephone communications (or lines such as wireless) of the State Telegraphic Department and the similar Imperial and State Offices, as also the communications of the private telegraph installations which have already been authorised at the time of granting the foregoing licence, must not be disturbed.

7. The plant is to be erected and continually maintained in such a manner that it cannot be prejudicially affected by the State telegraph and telephone lines. Any charges which may be incurred in removing possible causes of disturbances are to be borne by the owner of the plant.

8. The officials of the State Telegraphic Department are entitled to have access to the rooms and essential parts in which the wireless plant or any part thereof may be situated, and also to be given facilities for informing themselves as regards the arrangements which may have been made for the carrying out of the experiments.

9. The owner of the plant is responsible for any possible damage which may occur through the working of the wireless installation. He is responsible for the safeguarding of the plant and for preventing the illegal use of same by unauthorised persons.

10. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay.

11. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraphic Department.

12. The owner undertakes to pay an annual fee of m. to the State Post and Telegraph Department.

13. Failure to give effect to the foregoing conditions may involve the withdrawal of the licence.

14. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out, at his own cost and without delay, any alteration or extension of the terms of the licence contract.

15. The holder of the licence, as a guarantee that he will observe the licence conditions, has to deposit an amount of m. with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

Accepted
the _____ of _____
Signed _____

1922 .

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR EXPERIMENTAL PURPOSES.

F 1. The licence for the erection and for the working of the wireless plant is granted on the understanding that it may be revoked. The transfer of the licence to third parties is prohibited.

2. The deed of licence is a notice attested by the Imperial Postal Administration regarding the terms of working of the installed plant, such notice being acquiesced in by the owner of the plant by act of signature. The plant may be only erected and worked in accordance with the terms of this notice. Departures from the terms of the working instructions must be first approved by the Imperial Postal Administration.

3. In so far as the obtaining of the necessary consent of the authorities responsible for the upkeep of roads or of the owners of other parties interested in the surfaces crossed or used in passing over public roads and places with antennæ wires or in the erection of supporting posts on private ground is concerned, this is a matter which lies entirely with the owner of the plant.

4. The plant may only be used for carrying out wireless experiments used for the reception of the information serving the purpose of such experiments. The transmission of other news is not permitted either against payment or gratuitously. The reception of news from other wireless stations with the exception of the news marked "For all," is forbidden. Wireless communications intended for others and which may unintentionally come through must neither be written down, nor communicated, nor made use of in any way. The owner with this end in view must take steps to have his wireless plant safeguarded and to prevent its being used by unauthorised persons.

5. The plant must be erected and continually maintained in such a manner that any possible disturbing effect by the State telegraph and telephone lines cannot occur. Any charges which may be incurred in removing possible causes of disturbance are to be borne by the owner of the plant.

6. The officials of the State Telegraphic Department are entitled to have access to the rooms and essential parts in which the wireless plant or any part thereof may be situated, and to be given facilities for informing themselves as regards the arrangements which may have been made for the carrying out of the experiments.

7. The owner of the plant is responsible for any possible damage which may arise in respect of the State or third parties through the working of the wireless installation, pursuant to the legal regulations governing this matter.

8. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraphic Department.

9. The owner undertakes to pay a fee of m. to the State Telegraphic Department.

10. Failure to give effect to the foregoing conditions may involve the withdrawal of the licence.

11. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out any alteration or extension of the terms of the licence contract.

The owner will bear the whole cost arising from the amendment of the terms whether they are technical alterations to the wireless installations or of any other nature whatever.

Accepted.

12. The holder of the licence, as a guarantee that he will observe the licence conditions, has to deposit an amount of m. with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR THE RECEPTION OF THE NAUEN TIME SIGNALS.

G 1. The licence for erection and working of the wireless installation is granted on the understanding that it may be revoked. Transfer of the licence to third parties is prohibited.

2. A memorandum of the terms of working of the erected plant is attached to the deed of licence, and must be observed by the owner of the plant. The plant may only be erected and worked in terms of this memorandum. Departures from the terms of the memorandum are subject to the consent of the Secretary of State for Posts and Telegraphs.

3. The plant may only be used for the reception of time signals issued by the Nauen Station operating at present with a wavelength of 3,100 metres. Alteration of this wavelength is reserved.

4. The plant must comply with the following technical requirements:—

(a) The antenna must not be greater, and the connection between the antennæ and the detector circle must not be firmer, than may be necessary for the reception of the signals in view.

(b) The individual parts of the oscillating circuits, as also of the antenna circuit, must always be firmly connected together by means of solder. Exceptions to this rule are only permissible in the case of the switches of the detectors and long distance receivers.

(c) The soldered section must be enclosed within the casing containing all the parts of the apparatus, and is to be closed up by means of lead in such a way that only the switches of the detector and long distance receiver are accessible to the owner of the plant. A wire with a suitable insulating cover is to be used for the antenna conductor external to this enclosed part.

(d) Supplementary insertion of conductors or tuning devices is forbidden.

5. The plant is to be erected and maintained in such a manner that it cannot be prejudicially affected by the State telegraph and telephone lines. Any charges which may be incurred in removing possible causes of disturbance are to be borne by the owner of the plant.

6. The owner of the plant is responsible for any damage which may occur through the working of the wireless installation.

7. The officials of the State Telegraph Department are authorised to visit the premises in which the wireless installations or parts thereof are erected, and to take cognisance of the

arrangements which may have been made for carrying out the experiments.

8. The owner of the plant is absolutely obliged under full responsibility to see that under all circumstances messages emanating from other wireless installations and which may be received by him, are kept secret. He is likewise responsible for the safeguarding of the wireless plant and for prevention of its illegal use by unauthorised parties. Failure to do so would involve the withdrawal of the licence.

9. An order from the State Telegraphic Department requiring that the working of the plant shall be temporarily discontinued must be obeyed without delay. During the period of the stoppage of working of the plant, the wireless arrangements or parts thereof must be so dealt with that the use of the installation is rendered impossible. The decision in this connection lies with the State Telegraph Department.

10. The owner of the plant undertakes to pay an annual fee of m. to the State Telegraph Department.

11. Amplification or alteration of the foregoing conditions is reserved. The owner is under obligation to carry out any alteration or extension of the terms of the licence contract without delay at his own cost.

Accepted

the _____ of _____ 1921.

Signed

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS STATIONS (TRANSMITTING AND RECEIVING STATIONS) FOR OVERLAND POWER STATIONS, WATERWORKS, ETC.

H 1. The licence for the erection and working of wireless installations in so granted to in the understanding that it may be revoked.

In the event of the high potential current undertaking or its working passing into other's hands, the transfer of the contract to the legal successor is to be notified without delay to the State Postal Department.

2. The licence deed is an accompanying memorandum approved by the State Postal Department referring to the terms of working of the installed plant, which must be acquiesced in by the owner of the plant under signature.

The installations can only be carried out and worked in terms of this memorandum. Departures from the terms of this memorandum require the consent of the State Postal Department. Any alterations considered later to be necessary in the working instructions set forth in the memorandum in regard to supply of current, the wave to be used, call signals, working periods, etc., are determined by the State Telegraphic Department after consultation with the owner and are to be given effect to.

3. In so far as it may be necessary to obtain the consent of the authorities charged with the upkeep of roads, property owners or other interested parties for stretching over public ways and places antennæ wires and wire conductors for telephonic communication by means of high frequency appliances, or for erecting supports on private property, the obtaining of such consent necessary for the purposes indicated is entirely a matter for the owner of the plant.

4. The range of communication of the different wireless working stations is regulated by the corresponding memorandum. As regards other wireless stations than those indicated in the memorandum, immediate exchange of messages is not admissible.

Only such news may be transmitted by the wireless plant as refer to the working of the high potential undertaking or the news establishments themselves. The transmission of other news is not allowed either against payment or gratuitously. The reception of news from other wireless stations is forbidden. Wireless communications which may inadvertently be picked up from outside sources must neither be written out, communicated to others, or made use of in any way.

The owner of the plant must have it specially safeguarded in order to ensure its not being used by unauthorised persons.

Every conversation must commence with the indication of the station taking part in such conversation (name and place) when using the telegraphic service with the call signal stipulated by the State Telegraphic Department.

5. When transmitting no more electrical energy must be used than is set forth in the corresponding memorandum. Any departure from the range of wave stated in the memorandum is not permissible. Accordingly the erection of the apparatus used in the wireless plant must be in such correspondence with technical improvements that the use of waves beyond the admissible wave range is impossible, and picking up of wireless communications carried on other waves from other sources is impracticable. Furthermore, suitable means must be employed with the object of preventing high vibration of a character calculated to disturb other wireless communications.

6. The telegraph and telephone traffic (by means of conductors such as wireless) of the State Telegraph Service and other Imperial and State offices, as also private telegraph plants already in operation or invitation of the communication by means of the wireless plant, must not be disturbed by the working of the said wireless plant.

7. The technical arrangements and installations of the wireless plant are to be carried out and constantly maintained in such a manner that the disturbing influence of telegraph and telephone installations of the authorities mentioned under paragraph 6 cannot operate.

Any charges which may arise from rectifying such disturbances are to be borne by the owner of the plant.

8. Any order made in special cases by the State Telegraphic Department for the temporary suspension of the work must be obeyed without delay. During this time the working arrangements of the plant must be so dealt with in

accordance with the judgment of the State Telegraphic Department that utilisation of the news plant is excluded. The State Telegraphic Department will supervise the carrying out of the arrangements decided upon.

The order may either be communicated in writing or by telegraph by the Chief Postmaster, or verbally by an official of the State Telegraphic Department provided with the necessary authority.

9. The officials of the State Telegraphic Department who may present themselves in such capacity are invested with the right of access at all times to the rooms or premises in which the wireless installations or parts thereof may be, and to take cognisance of the arrangements appertaining to the wireless plant and of the working of communications.

10. The owner of the plant is responsible, pursuant to legal enactments on the subject, for any damage which may be sustained by the State Telegraphic Service or third parties through the erection and working of the plants.

11. The owner of the plant undertakes to pay an annual fee of *m.* to the State Telegraphic Service for each working station. The fixing of other fees is reserved.

12. Non-compliance with the foregoing conditions may entail the rescission of the licence granted.

13. The amplification or alteration of the foregoing conditions is expressly reserved. In so far as such alterations affect the technical arrangements of the wireless stations or the working of the news plant, a suitable period for the carrying out of these alterations will be fixed as a matter of necessity.

All charges arising from the alteration of conditions are to be borne by the holder of the plant, whether these are technical alterations in the wireless arrangements or of any other nature.

14. The holder of a licence, as a guarantee that he will observe the licence conditions, has to deposit an amount of *m.* with the State Telegraph Administration. This is subject to the assimilation of the amount of guarantee to the monetary value at the time. The service can only be begun after payment of the amount.

At the expiration of the licence the amount deposited, after fulfilment of all the obligations towards the State Telegraph Administration in respect of the erection and working of the installation, will be returned to the holder of the licence.

Accepted.

GIBRALTAR

[See Maps 2 and 10]

THERE are no commercial wireless telegraph stations in Gibraltar, and the right to use wireless telegraphy is reserved to the Government. Private wireless of any description, whether amateur, commercial, or experimental, is strictly forbidden, unless by special licence granted by the Governor, not only the control, but the possession and working of radio-telegraphy, being exclusively vested in military or naval hands.

We print below the ruling Ordinances and Regulations:—

A—Extracts from Ordinance No. 4 of 1885—"The Summary Conviction Ordinance, 1885."

B—Receiving Licences issued under above Ordinance.

C—Rules as to use on Merchant Ships.

D—Ship Licence.

E—Ordinance as to Wireless Telegraphy on Ships.

F—Further Rules as to use on Merchant Ships.

A (1). This Ordinance may be cited as "The Summary Conviction Ordinance, 1885."

38. No person shall import, keep, use, or establish in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the licence in writing of the Governor, and under such terms and conditions as may be prescribed in such licence, which licence the Governor may in his discretion at any time cancel and revoke.

39. No person shall work any apparatus for wireless telegraphy installed on merchant ships, whether British or foreign, while in Gibraltar, otherwise than in accordance with rules made in that behalf by the Governor, and the Governor may, by any such rules, impose penalties recoverable summarily for the breach of any such rules, not exceeding £10 for each offence, and may provide for the forfeiture on any such breach of apparatus for wireless telegraphy installed or worked on such ships. All such rules shall be published in the *Official Gazette*, and after such publication shall have the same force and effect as if enacted in this Ordinance.

40. It shall be lawful for the Governor by order in writing to authorise the Chief of Police or any other person named by him in such order to enter at any time by day or night, and by force, if necessary, any premises or place or any ship, hulk or other craft in Gibraltar, and to search for any such apparatus or installation or pigeons as described in Sec. 37, 38 or 39 of this Ordinance, and to seize and remove the same to be dealt with in such manner as the Governor may direct.

41. Any person offending against Sec. 37 or 38 of this Ordinance, or resisting or in any way interfering with any person charged with the execution of an order issued by the Governor under Sec. 40, may be arrested without warrant, and shall be liable to a penalty not exceeding £50, or in the discretion of the magistrate to imprisonment with or without hard labour for any term not exceeding three months.

B Form of Receiving Licence issued under above Ordinance.—

LICENCE TO ESTABLISH WIRELESS TELEGRAPHY RECEIVING SETS.

To all whom these Presents shall come.

THE SCHEDULE.

CONDITIONS.

1. The apparatus installed or set up shall be used solely for the receipt of messages by wireless telegraphy or telephony.

2. The licensee shall not divulge nor allow to be divulged to any person (other than a duly authorised officer of the Government of Gibraltar or a complete legal tribunal) or make any use whatsoever of any message received by means of the apparatus, except messages in connection with the experiments of the licensee received from another experimental station, time signals, musical performances, and messages transmitted by any station for general information.

3. The apparatus shall be fitted with crystal receivers or with valves not capable of oscillation.

4. The combined height and length of the aerial used shall not exceed 100 feet.

5. A fee of 10s. shall be payable to the Colonial Treasurer on the issue of this licence, and a similar fee shall be payable annually in advance so long as this licence remains in force.

6. This licence may be cancelled and revoked at any time at the discretion of the Governor.

C The following rules as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in Gibraltar, were made on May 3rd, 1909, under "The Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909"—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Gibraltar shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in Gibraltar or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of Gibraltar, except with the special or general permission in writing of the Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Any person offending against any of these rules shall be liable to a penalty not exceeding ten pounds for each offence recoverable summarily under "The Justices Ordinance, Gibraltar, 1890," and any apparatus for wireless telegraphy installed or worked on such ship may be forfeited to His Majesty.

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

D To all to whom these Presents shall come.

I,....., Governor of the City and Garrison of Gibraltar send greeting:

Whereas Messrs..... of..... (hereinafter call the licensee) is desirous of establishing, installing, working and using, in a ship belonging to the licensee to wit the wireless telegraphy:

And Whereas by reason of the provisions of the Summary Conviction Ordinance, 1885, it is unlawful to establish, keep or use in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the licence in writing of the Governor and under such terms and conditions as may be prescribed in such licence.

And Whereas at the request of the licensee I have agreed to grant to the licensee the licences powers and authorities hereinafter expressed and contained for the period and upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now, I, the above-named..... Governor of the City and Garrison of Gibraltar, in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee, during the term or period commencing on the day of

the date hereof and until these presents and the licence or permission hereby given shall be determined or revoked, licence and permission.

(i) To establish, install and work for the purposes hereinafter mentioned on board the steamship apparatus for wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus");

(ii) To send and receive messages by means of the licensed apparatus between the said steamship and coast stations and other ship stations.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions :—

1. The provisions of the Imperial Telegraph Acts, 1863 to 1916, and the Regulations made thereunder shall be deemed to apply to this licence and on any breach thereof this licence shall be null and void.

2. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, the Service Regulations made thereunder and any modification of the Convention or Regulations made from time to time.

3. The licensee shall, except as set out hereinafter, use the licensed apparatus solely on behalf and in the course of the business of the licensee and the licensee shall not receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

4. The licensee shall so far as possible receive from ships and lights stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

Given under my hand and seal at Gibraltar this.....day of....., 19..

AN ORDINANCE TO MAKE PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

NOVEMBER 8TH, 1920.

E Be it enacted by His Excellency the Governor of the City and Garrison of Gibraltar, as follows :—

1. (1) Every seagoing British ship registered in Gibraltar being a passenger steamer or a ship of sixteen hundred tons gross or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Ordinance, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules :

Provided that the Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Governor shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried :

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Imperial Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but, if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) The Governor shall appoint a surveyor of ships or a wireless telegraphy inspector, who may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and for the purpose of that inspection such surveyor or inspector shall have all the powers of a Board of Trade inspector under the Imperial Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Governor to the Treasurer and Collector at Gibraltar, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance.

(5) The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Imperial Wireless Telegraphy Act, 1904, or any Order-in-Council, or regulations made thereunder; or by the Imperial Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Gibraltar, apply to ships other than British ships registered in Gibraltar while they are within the port of Gibraltar in like manner as they apply to British ships so registered.

3. (1) This Ordinance may be cited as the Merchant Shipping (Wireless Telegraphy) Ordinance, 1920, and shall come into operation on the first day of December, 1920.

(2) This Ordinance shall be construed as one with the Merchant Shipping Ordinance, 1886, and "passenger steamer" shall mean a steamer which carries more than twelve passengers.

Passed, 8th November, 1920.

By Command,

Colonial Secretary.

RULES MADE BY THE GOVERNOR UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ORDINANCE, 1920.

INTERPRETATION.

F 1. In these Rules—

The expression "coasting trade" means trade between such ports as would constitute the vessel a "home trade ship" as defined in the Merchant Shipping Ordinance, 1886.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows :—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons. In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one and a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

- | | |
|--|---|
| (a) Voyage exceeding 48 hours from port to port. | Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate. |
| (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. | Two operators of whom one shall hold a First or a Second Grade Certificate. |
| (c) Voyage not exceeding 8 hours from port to port. | One operator who shall hold a First or a Second Grade Certificate. |

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS AND WATCHERS.

- | | |
|--|--|
| (a) Voyage exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade Certificate, and two watchers. |
| (b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade Certificate, and one watcher. |
| (c) Voyage not exceeding 8 hours from port to port. | One operator who shall hold a First or a Second Grade Certificate. |

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Governor a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid :—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus :—

NATURE OF VOYAGE. NUMBER AND GRADE OF OPERATORS.

- | | |
|--|--|
| (a) Voyage exceeding 48 hours from port to port. | Two operators, one of whom shall hold a First Grade Certificate. |
| (b) Voyage not exceeding 48 hours from port to port. | One operator who shall hold a First or a Second Grade Certificate. |

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Governor and watchers shall be certificated by the Postmaster-General of the United Kingdom hereinafter called the Imperial Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid :—

(i) An operator who holds the Imperial Postmaster-General's First Class Certificate of Proficiency and who has had three years' experience as an operator may be employed as if he held a First Grade Certificate, but if an operator holding a First Grade Certificate is available an operator holding a First Class Certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade Certificate.

(iii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade Certificate.

11. The Governor may accept in lieu of the certificate of the Imperial Postmaster-General certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of December, 1920.

Given under my hand and seal, at Gibraltar this day of

By Command,

Colonial Secretary.

GOLD COAST

(See Maps 24 and 26.)

THE Gold Coast Colony is administered by a Governor with an Executive and a Legislative Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. S. B. Gosling	Postmaster-General	Accra.
Major J. F. O'Shaughnessy	Engineer-in-Chief of Posts and Telegraphs Dept.	Do.

ORGANISATION.

Radiotelegraphy was introduced in 1912, and in 1913 the Accra station was completed.

There are no privately owned experimental or amateur stations ; neither are there any wireless clubs or societies. In fact no licences have been issued to any classes of individual or corporations, radiotelegraphy in this Colony being still in its infancy.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in this Colony was "The Wireless Telegraphy Ordinance, 1903." This was followed by "The Wireless Telegraphy (Amendment) Ordinance, 1913." These Ordinances, however, were both of them repealed by "The Wireless Telegraphy Ordinance No. 15 of 1913."

Annexed to this Ordinance are regulations applying to Merchant Ships, and Rules for the Regulation of Wireless Telegraphy within territorial waters. The Laws and Regulations here printed are:—

A—Wireless Telegraphy Ordinance No. 15 of 1913
(dated October 4th, 1913).

B—Regulations (Merchant Ships).

C—Rule No. 17 of 1917.

A AN ORDINANCE (NO. 15) to provide for the regulation of Wireless Telegraphy, 4th October, 1913.

Be it enacted by the Governor of the Gold Coast Colony, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions, and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the Colonial waters otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the Colonial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate or District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any Commissioner or Assistant Commissioner of Police or any person appointed

in that behalf by the Commissioner of Police and named in the warrant, and a warrant so granted shall authorise the Commissioner or Assistant Commissioner of Police or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a District Commissioner's Court on the complaint of a Commissioner or Assistant Commissioner of Police or of any person thereto authorised by the Commissioner of Police in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy (Amendment) Ordinance, 1913, are hereby repealed.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the Colonial waters shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the Colonial waters and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being, or appearing to be, in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged

to have been committed with the person being or appearing to be, in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

RULE NO. 17 OF 1917.

C Under and by virtue of section 8 of the Defence of the Colony Ordinance, 1914, I, Sir Hugh Charles Clifford, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief of the Gold Coast Colony, with the advice of the Executive Council of the said Colony, do hereby make the following rules which I, with the advice aforesaid, consider necessary for the public safety and the Defence of the Colony.

1. The radiotelegraphic stations on board ships (other than His Majesty's ships of war) shall not be worked, except for the reception of messages, whilst such ships are within any harbour, port or within any roadstead within the Colonial waters of the Colony.

2. For the proper enforcement of the last preceding rule,

(a) The master of every ship of British or Allied register whilst in any such harbour, port or roadstead shall cause the sending and transmitting portion of the radio apparatus on such to be disconnected and to be

kept disconnected from the dynamo, accumulators, or other source of electrical power available, so that radio messages cannot be sent from the ship.

(b) If an officer appointed in writing by the Postmaster-General to examine the wireless apparatus on any ship shall so order, the master of such ship within such harbour, port or roadstead shall cause all portions of the radio apparatus on such ship to be disconnected or sealed in such manner as such officer shall order, and shall cause the same to be kept so disconnected or sealed while such ship is within such harbour, port or roadstead.

(c) The master of a ship of neutral register shall immediately on arrival in any such harbour, port or roadstead cause the aerial wires to be taken down completely and disconnected from the radiotelegraph apparatus on such ship and shall cause such wires to remain so down and disconnected while such ship is in such harbour, port or roadstead, and shall cause the operating room to be sealed and kept sealed and such other steps to be taken as any officer appointed by the Postmaster-General for the purpose may order.

Made at a meeting of the Executive Council held at Government House, Accra, this 1st day of September, 1917.

(Signed) HUGH CLIFFORD,
Governor.

GREAT BRITAIN.

(See Maps 2, 4 and 5).

Including : The Isle of Man and the Channel Islands.

CONTROL.

THE Postmaster-General is responsible for the administration of wireless telegraphy in Great Britain.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Rt. Hon. Sir Laming Worthington-Evans, Bart., G.B.E., M.P.	Postmaster-General	General Post Office, London, E.C.
Sir George Evelyn P. Murray, K.C.B.	Secretary to Post Office	Ditto.
Mr. F. J. Brown, C.B., C.B.E., M.A., B.Sc.	Assistant Secretary to Post Office	Ditto.

DEPARTMENT OF THE INSPECTOR OF WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Comdr. F. G. Loring, R.N., M.I.E.E.	Inspector of Wireless Telegraphy	General Post Office, London, E.C.
Lt.-Col. C. G. G. Crawley, R.M.A., M.I.E.E.	Deputy Inspector of Wireless Telegraphy.	Ditto.
Mr. F. Addey, B.Sc. (Lond.), M.I.E.E., Fellow I.R.E.	Assistant Inspector of Wireless Telegraphy.	Ditto.
Mr. S. E. J. Burrow	Ditto	Ditto.
Lt.-Comdr. E. L. C. Grattan, D.S.O., R.N.	Ditto	Ditto.
Capt. A. H. Read, M. Eng.	Ditto	Ditto.

ORGANISATION.

Early in 1914 a Bill was presented to the House of Commons by the President of the Board of Trade to amend the laws relating to merchant

shipping so as to give effect to the International Convention for the safety of Life at Sea, signed at London on January 20th, 1914. Under the title "Merchant Shipping (Convention) Act, 1914," this Bill was passed in August, 1914, and was due to come into force on July 1st, 1915, but has not yet been put into operation. Part III of the Act refers to wireless telegraphy and is printed below.

Section 22 of the Defence of the Realm Regulations expired on August 31st, 1921.

A new Act—the Merchant Shipping (Wireless Telegraphy) Act, 1919—came into operation on September 1st, 1920. We print the Act and rules hereunder.

Regarding experimental and private business stations, a new Wireless Telegraphy Bill was introduced into the late Parliament, but was not proceeded with in consequence of pressure of business. The various forms of experimental and private business licence have been revised. The Bill, as introduced, is printed below.

The removal of restrictions on amateur working which has taken place was immediately productive of a keen stimulus to experimentalism, and the possibilities of broadcasting promise well for the future of the movement.

Licences for broadcast reception are now obtainable at any Post Office, and are issued subject to the proviso that the apparatus to be used has been passed by the British Broadcasting Company and the Postmaster-General acting in concert. The terms of the licence and regulations thereunder are printed below, together with a summary of the Report of the Broadcasting Committee and the new Post Office Regulations based thereon.

ADMINISTRATION.

The following is the list of items to be found below:—

- A**—Wireless Telegraphy Act, 1904.
- B**—Order in Council, February 29th, 1908.
- C**—Wireless Telegraphy (Foreign Ships) Regulations, 1908.
- D**—Ship Stations Licence.
- E**—Private Business Licence.*
- F**—Board of Trade Notice (Signalling Practice).
- G**—Merchant Shipping (Convention) Act, 1914. (Part III.)
- H**—Extracts from *London Gazette*, April 29th, 1919.
- I**—Merchant Shipping (Wireless Telegraphy) Act, 1919.
- J**—Rules made under Merchant Shipping (Wireless Telegraphy) Act.
- K**—Postmaster-General's authority for the use of Transmitting and Receiving Apparatus for Amateurs.
- L**—Postmaster-General's authority for the use of Receiving Apparatus only for Amateurs.
- M**—Extract from Convention relating to International Air Navigation, 1919.
- N**—Form of Licence for Wireless on Aircraft.
- O**—Admiralty Notice to Mariners No. 524 of March 25th, 1920.
- P**—Admiralty Notice to Mariners No. 838 of May 22nd, 1920.
- Q**—Admiralty Notice to Mariners No. 952 of June 15th, 1920.
- R**—Air Ministry Notice to Airmen No. 103 of September 30th, 1920.
- S**—A Bill to Amend the Wireless Telegraph Act, 1904 (Provisional).
- T**—Licence and Regulations for Broadcast Reception.

* The terms of this licence are no longer operative, and a new form of licence is likely to be issued shortly.

U—Regulations for Post Office approval of Broadcast Reception Apparatus.

V—Report of the Broadcasting Committee 23rd August, 1923.

W—Suggested new form of Receiving Licence.

X—New Regulations regarding Licences for Broadcast Reception, etc.

Y—Experimenters' Wireless Licences (revised terms).

WIRELESS TELEGRAPHY ACT, 1904.

A Following the termination of the meeting of the delegates at the International Conference in Berlin in 1903, the British Government drafted a Wireless Telegraph Act to define the official position of the Postal and Telegraph Department in the United Kingdom in regard to the new development. The Act received Royal assent on August 15th, 1904, and the text is as follows:—

1. (1) A person shall not establish any wireless telegraph station, or install or work any apparatus for wireless telegraphy, in any place or on board any British ship except under and in accordance with a licence granted in that behalf by the Postmaster-General.

(2) Every such licence shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions and restrictions on and subject to which the licence is granted, and any such licence may include two or more stations, places, or ships.

(3) If any person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour, and be liable, on conviction under the Summary Jurisdiction Acts, to a penalty not exceeding ten pounds, and on conviction on indictment to a fine not exceeding one hundred pounds, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade.

(4) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Sections 684, 685, and 686, of the Merchant-Shipping Act, 1894, (which relate to the jurisdiction of courts and justices), and section 693 of the same Act (which relates to distress for sums ordered to be paid by masters and owners of ships), shall apply to the jurisdiction of courts and justices in respect of ships, and to distress under this Act.

(6) The Postmaster-General may make regulations for prescribing the form and manner in which applications for licences under this Act are to be made, and, with the consent of the Treasury, the fees payable on the grant of any such licence.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in the Telegraph Acts 1863 to 1904, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Act shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) Where the applicant for a licence proves to the satisfaction of the Postmaster-General that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the Postmaster-General may think proper, but shall not be subject to any rent or royalty.

(2) Where an applicant for a licence satisfies the Postmaster-General that a wireless telegraph station is to be used solely for the transmission of telegrams which are within the first or second exception from the exclusive privilege of transmitting telegrams conferred upon the Postmaster-General by the Telegraph Act, 1869, a licence for that purpose, if granted, shall not be subject to any rent or royalty.

(3) It shall be lawful for the Postmaster-General, due regard being had to the maintenance and exercise of effective control over wireless telegraphy, to grant special licences at reduced terms for the establishment and working of wireless telegraph stations to be used exclusively for the transmission within the United Kingdom of news to public registered newspapers. A schedule of all reduced rents or royalties imposed by any special licences shall be laid before both Houses of Parliament within fourteen days of the commencement of the session next succeeding the grant of any such licences.

3. (1) This Act may be cited as the Wireless Telegraphy Act, 1904, and may be cited with the Telegraph Acts, 1863 to 1904.

(2) This Act shall extend to the whole of the British Islands and to all British ships in the territorial waters abutting on the coast of the British Islands, and the Royal Courts of the Channel Islands shall register this Act accordingly.

(3) His Majesty in Council may order that this Act shall, subject to any conditions, exceptions, and qualifications contained in the order, apply during the continuance of the order to British ships whilst on the high seas.

(4) A person shall not work any apparatus for wireless telegraphy installed on a foreign ship whilst that ship is in territorial waters otherwise than in accordance with regulations

made in that behalf by the Postmaster General, and the Postmaster-General may, by any such regulations, impose penalties recoverable summarily for the breach of any such regulations not exceeding ten pounds for each offence and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Act shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. In the application of this Act to Scotland the expression "Misdemeanour" means crime and offence.

5. In the application of this Act to the Channel Islands and the Isle of Man:—

(1) The Lieutenant-Governor of the Island of Jersey or the Island of Guernsey, and the Governor, Lieutenant-Governor, or Deputy-Governor of the Isle of Man, as the case may require, shall be substituted for the Board of Trade.

(2) Offences may be prosecuted, fines recovered, proceedings taken, and search warrants issued in such courts and in such manner as may for the time being be provided in the Channel Islands and the Isle of Man by law, or, if no express provision is made then in and before the courts and in the manner in which the like offences, fines, proceedings, and warrants may be prosecuted, recovered, taken, or issued therein by law, or as near thereto as circumstances admit, and the bailiff or his lieutenant, or any jurat of the Royal Court in the Island of Jersey or the Island of Guernsey, and the judge or any jurat of the Court of Alderney, and the high bailiff or two justices of the peace in the Isle of Man shall, respectively be substituted for a justice of the peace.

6. This Act shall continue in force until the thirty-first day of July, nineteen hundred and six, and no longer unless Parliament otherwise determines. (It was renewed until December 31st, 1909, and has since been extended from year to year by the Expiring Laws Continuance Act.)

B The following Order in Council is dated February 29th, 1908:—

(1) The Wireless Telegraphy Act, 1904, shall apply to British ships whilst on the high seas, provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act, 1904, by reason of the installation or working of wireless telegraphy on such ship if the authority in such Possession or Protectorate having power by law so to do, shall have granted a licence for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such licence.

(2) The Interpretation Act, 1889, shall apply for the purpose of the interpretation of this Order as it applies for the purpose of the interpretation of an Act of Parliament.

(3) This Order shall be published in the *London Gazette*, and shall come into operation immediately from and after the expiration of three months after this Order is so published.

(4) This Order may be cited as "The Wireless Telegraphy Order, 1908."

C An Order was issued in 1908 (No. 496) containing regulations relating to foreign ships:—

1. In these Regulations unless the context otherwise requires—

"Wireless Telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1904.

"Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

"Territorial Waters" means such part of the sea adjacent to the coast of the British Islands as is deemed by international law to be within the territorial sovereignty of His Majesty, and includes harbours.

"Harbour" includes harbours properly so called, whether natural or artificial, estuaries, navigable rivers, piers, jetties, and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

When communications are made by means of wireless telegraphy between a foreign ship in territorial waters and a wireless telegraph station in the British Isles, the rules in force for the working of wireless telegraphy at that station shall be observed.

3. All apparatus for wireless telegraphy on board a foreign ship in territorial waters shall be worked in such a way as not to interrupt or interfere with—

(a) Naval Signalling, or

(b) The working of any wireless telegraph station lawfully established, installed, or worked in the British Islands or the territorial waters abutting on the coast of the British Islands, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. (1) Except with the special permission in writing of the Postmaster-General no apparatus for wireless telegraphy on board a foreign ship (other than a ship of war) shall be worked or used whilst such ship is in harbour in the British Islands.

(2) Without prejudice to the operation of the general provisions of these Regulations, the use of wireless telegraphy on board a foreign ship of war while in a harbour in the British Islands shall be subject to such rules (whether prohibitive or regulative) as may be made by the Admiralty from time to time.

5. (1) If at any time in the opinion of one of His Majesty's Principal Secretaries of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board foreign ships whilst in territorial waters shall be subject to such rules as may be made by the Admiralty from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

(2) Such notice as aforesaid shall be published in the *London Gazette*, the *Edinburgh Gazette*, and the *Dublin Gazette*, and in such

Other manner, if any, as to the Postmaster-General may seem fit.

6. (1) Any person who shall offend against any provision of these Regulations or of any Rules made by the Admiralty thereunder shall be liable on conviction under the Summary Jurisdiction Acts for every such offence to a penalty not exceeding ten pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy installed or worked on board the ship on which the offence was committed shall be seized and forfeited.

(2) For the purposes of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any foreign ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(3) Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

8. These Regulations shall come into operation on the first day of July, 1908.

9. These Regulations may be cited as "The Wireless Telegraphy (Foreign ships) Regulations, 1908."

D The following is a copy of the form of Licence granted by the Postmaster-General to establish Wireless Telegraph Ship Stations:—

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come

I, The Right Honourable

His Majesty's Postmaster-General send greeting;

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1909 and the Wireless Telegraphy Order 1908 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a licence granted in that behalf by the Postmaster-General:

And whereas — (hereinafter called the licensee) has applied to the Postmaster-General for the grant of a licence to establish install and work apparatus for wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904 at the ship station or stations mentioned in the Schedule hereto.

Now I the above-named — His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December next and thereafter so long as the Wireless Telegraphy Act 1904 shall remain in force unless and until these presents and the licence and permission hereby given shall be determined licence and permission—

(i) To establish install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Proved that—

(a) Each ship station shall comply in all respects with the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919;

(b) The apparatus installed at each ship station shall be of the character specified in the said Schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Post Office for the time being. The licensed apparatus may be so constructed as to use any of the wavelengths specified in columns 5 and 6 of the Schedule hereto or any wavelengths prescribed by any administration for communication with direction finding stations and such other wavelengths as may be authorised in writing from time to time by the Postmaster-General Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used for transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention 1912:

Provided further that only the wavelength of 600 metres (except as directed by the Admiralty) shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(e) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word;

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations Provided that the licensee shall not except with the consent in writing of the Postmaster-General at any time send spoken messages from the said ship stations or send or receive messages from and at the said ship stations when in any harbour in the British Islands; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expression "the International Telegraph Convention" and "the International Telegraph Regulations" means respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee or the despatch or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Postmaster-General so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing

interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall keep the licensed apparatus and in particular the headgear receivers thereof in a clean and sanitary condition.

10. The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of operators and watchers.

11. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge order of transmissions or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of any British Possession or Protectorate the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

13. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

14. The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Postmaster-General and the licensee shall provide for the working of each station such certified operators and watchers as are required by the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act, 1919.

15. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this licence entitling the Postmaster-General under Clause 24 hereof to revoke and determine this licence.

16. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall

1 Name of Ship on which Station established.	2 Call- Signal.	3 Normal Range of Signal- ling in Nautical Miles.	Character of Apparatus.		Power.		9 If Alter- nator is used, Number of Cycles per Second.
			4 System of Radiotele- graphy with the Charac- teristics of the System of Emission.	Wavelengths (in Metres). 5 Spark or Inter- rupted Con- tinuous Wave. 6 Con- tinuous Wave.	7 Source.	8 Maximum to be taken by Sending Instru- ments	
					Ship's mains.		

be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention 1912 and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the registered office of the licensee for the time being or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

17. The licensee shall render to the Postmaster-General such accounts as the Postmaster-General shall direct in respect of all charges due or payable under the Radiotelegraph Convention 1912 in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Postmaster-General at such times and in such manner as the Postmaster-General shall direct all sums which shall be due from the licensee under such accounts.

18. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

19. The licensee shall carry on every ship on which a ship station is established under this licence a print or copy of the licence certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Postmaster-General for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention 1912.

20. The licensee shall forthwith pay to the Postmaster-General for and in respect of the licence hereby granted a sum of ———* in respect of each ship station at which the licensed apparatus is installed and in addition thereto a sum of two pounds in respect of each such ship station on the first day of January in each year during which the licence remains valid.

21. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences powers or authorities.

22. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Customs or Police Officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such

*The fee payable for the first year will be £2, 30s., £1 or 10s. according to whether the licence is issued in the first, second, third or fourth quarter of the year.

messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

23. At any time after the 31st day of December 192 the Postmaster-General may in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

24. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained

then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licences powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licences powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

25. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

26. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents

may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the registered office for the time being of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

Lastly any licence or permit heretofore granted by the Postmaster-General to the licensee in respect of any of the ships specified in the Schedule hereto is hereby revoked.

As witness my hand and seal this day of one thousand nine hundred and

Signed sealed and delivered by

On behalf of the Postmaster-General in the presence of

LICENCE TO USE WIRELESS TELEGRAPHY FOR PRIVATE BUSINESS.*

Whereas

E of in the county of (hereinafter called "the licensee") is desirous of establishing installing working and using a system of wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904:

And whereas by reason of the provisions of the Telegraph Acts 1863 to 19 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place except under and in accordance with a licence granted in that behalf by the Postmaster-General and it is also unlawful save as in the said Acts provided to transmit telegrams within the United Kingdom:

And whereas at the request of the licensee I have agreed to grant to the licensee the licences powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above-named His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December 19 licence and permission—

(i) To establish and install and work at the stations specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at each station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) To transmit and receive messages on the private business of the licensee by means of the licensed apparatus between the said stations.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:

1. In these presents (and in the Schedule hereto) the following words and expressions

* The terms of this licence are no longer operative, and a new form of licence is likely to be issued shortly.

shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say) :—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

Apparatus shall be deemed to be "syntonised" when the transmitting apparatus is so adjusted as to communicate with a receiver which has a corresponding adjustment and to produce as little effect as possible on a receiver not having a corresponding adjustment.

2. (1) The licensed apparatus shall not be used by the licensee or by any person either on behalf or by permission of the licensee for any purpose except for the transmission and receipt of such messages as aforesaid between and at the stations specified in the Schedule hereto.

(2) No money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee in respect of the transmission or receipt of any messages by means of the licensed apparatus or any part thereof.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at any signal station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee shall if so required in writing by the Admiralty cease to use the licensed apparatus for such period (not exceeding two hours in any one day) as may be specified by the Admiralty.

(4) If the Admiralty are of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Postmaster-General close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 19 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business.

5. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established in the British Islands or the territorial waters abutting on the coasts of the British Islands (whether on shore or on any ship) by or for the purposes of the Postmaster-General or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees—

(a) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(b) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(c) Generally with respect to avoiding interference between one wireless telegraph station and another.

6. The licensed apparatus shall not without the consent in writing of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

7. The licensee shall at all times indemnify the Postmaster-General against all actions, claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

8. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

9. Subject to the provisions of this licence the licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

10. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such places respectively and the working and user of such apparatus and telegraphic instruments respectively.

11. (1) All apparatus used or intended to be used by the licensee shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic

line of the Postmaster-General which may from time to time exist or which it is probable that the Postmaster-General may have occasion to erect place fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof.

(2) In case any telegraphic line of the Postmaster-General shall be damaged or the efficient working or user thereof shall be wholly or partially interrupted or otherwise interfered with and the Engineer-in-Chief for the time being of the Post Office shall certify in writing under his hand that such damage interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee or by anything done by or on behalf of the licensee in relation thereto the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said Engineer-in-Chief shall certify that such addition or substitution is reasonably required.

(3) For the purposes of this Article the expression "telegraphic line" has the same meaning as in the Telegraph Act 1878 and the expression "telegraphic line of the Postmaster-General" includes a telegraphic line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Government or other body or person.

12. (1) The licensee shall pay to the Postmaster-General on the 1st day of December next for and in respect of the licence hereby granted a royalty of £ per annum in respect of each station.

(2) In the event of the renewal of this licence the said royalty shall be payable on the same day in each succeeding year.

13. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences powers or authorities hereby granted or any of such licences powers or authorities.

14. If and whenever in the opinion of one of His Majesty's Principal Secretaries of State an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the said Secretary of State by warrant under his hand to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the said Secretary of State may enter upon the stations offices and works of the licensee or any of them and take possession thereof and use the same as aforesaid.

15. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-

General under any condition or provision herein contained.

16. 16. In any of the following cases (that is to say) :—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained;

then and in any such case the Postmaster-General may by writing under his seal revoke and determine these presents and the licences powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said licences powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

17. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature or those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

18. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any one of the Secretaries or Assistant Secretaries for the time being of the Post Office, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

F In October, 1912, the Board of Trade, at the request of the Lords Commissioners of the Admiralty, issued a notice directing the attention of Masters and Owners of British Merchant Vessels to the necessity for arranging for periodical practices in Wireless Telegraphy communications between H.M. Ships of War and Ships of the British Mercantile Marine for the purpose of ensuring efficient and reliable communication when required.

The co-operation is invited of all British shipowners and masters whose ships are fitted with wireless telegraphy, in order to give effect to the following proposals:—

(1) At 8.30 a.m. and 2.30 p.m. daily any single man-of-war (destroyers and small craft excluded) or one man-of-war in a fleet in company, detailed by the Senior Naval Officer present, will adjust her wireless telegraphy transmitting and receiving apparatus to the commercial 600 metre wavelength and make the call "CCCC," followed by her own commercial call sign, indicating that she is prepared to carry out an exercise with any British merchant ship within range.

On a British merchant ship receiving this call she will answer and say whether or not she is prepared to proceed with the exercise. Should more than one merchant ship answer, the man-of-war will indicate which is to exercise and which is to wait.

The exercise will then proceed, but no messages are to be exchanged which are not authorised by the respective captains and masters of the ships practising. No message received during such exercises is to be forwarded beyond the ship actually receiving the message and no payment for any message can be made. The exercises are to be considered as strictly on Service and not for any commercial advantage.

(2) In all such exercises the man-of-war is to be considered the controlling ship.

(3) The exercises will cease at 9.15 a.m. and 3.15 p.m. respectively, or before, at the discretion of the captains concerned.

(4) These exercises are only to be carried out between vessels neither of which is within 150 miles range of any commercial shore station using the 600 metre wavelength, and are to cease at once should one of H.M. ships so direct.

MERCHANT SHIPPING (CONVENTION) ACT, 1914.

G An Act to make amendments of the law relating to Merchant Shipping as are necessary or expedient to give effect to an International Convention for the Safety of Life at Sea, signed in London on January the twentieth, nineteen hundred and fourteen, and for purposes incidental thereto. (August 10th, 1914.)

PART III.

(Which deals with Wireless Telegraphy.)

15. (1) Subject to the provisions of this Act every British ship registered in the United Kingdom which carries 50 or more persons shall be provided with a wireless telegraphy installation, and shall maintain a wireless telegraphy service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with certified operators and watchers at least in accordance with those rules. Provided that the obligations imposed by this section shall not come into operation until such date, not being less than six months after the making of those rules, as may be specified in the rules.

(2) In reckoning the number of persons carried on a ship for the purpose of this section, persons shall not be counted who are exceptionally and temporarily carried on a ship—

(a) As the result of *force majeure*; or

(b) As the result of the necessity of increasing the number of the crew to fill the places of members of the crew who are ill or disabled; or

(c) As the result of the obligation on the part of the master to carry shipwrecked persons, or persons in like circumstances; or,

(d) If so provided by rules of the Board of Trade, as cargo hands for a part of the voyage not being between one continent and another and not being, during the time the hands are carried, outside the limits of latitude thirty degrees north and thirty degrees south.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily the fine shall not exceed one hundred pounds.

16. (1) The Board of Trade, in consultation with the Postmaster-General, shall make such rules with respect to wireless telegraphy installations and service on British ships which are registered in the United Kingdom and with respect to the carrying on those ships of operators and watchers for the purposes of wireless telegraphy, as appear to them necessary or expedient to carry into effect the provisions of the Convention mentioned in Part V of the Third Schedule to this Act.

(2) The Board of Trade may by rules made under this section exempt from the obligations of this Act as to wireless telegraphy—

(a) Ships while on voyages the course of which does not take the ship more than a hundred and fifty sea miles from the nearest coast, if the Board are satisfied that the route and the conditions of the voyage are such as to render compliance with those obligations unreasonable or unnecessary; and,

(b) Sailing ships on which owing to the peculiar or primitive nature of their build, it is impossible to provide a proper wireless telegraphy installation.

(3) The Board of Trade may by rules made under this section provide that any automatic calling apparatus which is certified by them to be efficient and to have been accepted by the parties to the Convention may be substituted, for the purposes of the provisions of this Act, and any rules made thereunder relating to wireless telegraphy, for a certified operator or watcher.

17. The Board of Trade may postpone the operation of the provisions of this Act relating to wireless telegraphy as respects any particular ship for such period as the Board of Trade determine in each case, if it is shown by the owners of the ship that they have taken all reasonable steps to comply with the provisions of this Act as respects the ships, but that they have been unable to do so owing to difficulties in obtaining delivery of any wireless telegraphy apparatus or of obtaining the service of certificated operators or watchers.

The period of postponement under this section shall not exceed one year in the case of ships which are required in pursuance of the Convention to provide a first-class wireless telegraphy service, and two years in the case of ships which are so required to provide a third-class wireless telegraphy service, and in the case of ships which are so required to provide a second-class wireless telegraphy service shall not exceed one year as respects the provision of a wireless telegraphy installation and two years as respects the provision of a continuous watch.

THE SCHEDULE.

Name of Station.	Normal Range of Signalling.		Character of Apparatus.		Power.		If Alternator is used, No. of Cycles per Second.
	By Night.	By Day.	Description of Receiving Apparatus.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken by Transmitting Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

H EXTRACTS FROM SUPPLEMENT TO THE LONDON GAZETTE OF TUESDAY, THE 29TH OF APRIL, 1919.

Wednesday, 30th April, 1919.
Air Ministry.

AIR NAVIGATION REGULATIONS, 1919.
ORDER OF THE SECRETARY OF STATE UNDER THE AIR NAVIGATION ACTS, 1911 TO 1919.

In pursuance of the powers conferred upon me by the Air Navigation Acts, 1911 to 1919, and all other powers enabling me in that behalf, I, the Right Honourable Winston Spencer Churchill, one of His Majesty's Principal Secretaries of State, by order make the following regulations:—

GENERAL CONDITIONS OF FLYING.

1. No aircraft shall fly within the limits of the British Islands and the territorial waters adjacent thereto unless the following conditions are complied with:—

(6) No mails shall be carried without the consent in writing of the Postmaster-General and no wireless apparatus shall be installed or worked except under and in accordance with a licence granted by the Postmaster-General, containing such conditions as may be approved by the Secretary of State:

PRODUCTION OF LICENCES, CERTIFICATES AND LOG-BOOKS FOR INSPECTION.

6. (1) Any member of the personnel of an aircraft shall on demand produce his licence for the inspection of any person authorised for the purpose by the Secretary of State.

(2) The owner and person in charge of any aircraft shall, on demand, produce for the inspection of any person authorised for the purpose by the Secretary of State, any certificates or licences relating to the aircraft, and also, in the case of passenger or goods aircraft, any of the prescribed log-books.—

EXCEPTIONS.

8. These regulations do not, except where otherwise expressly stated, apply—

(a) To military aircraft belonging to or employed in the service of His Majesty; or

(b) To any aircraft or to any persons if and to such extent as such aircraft or persons may be excepted from these regulations, or any of them, by direction of the Secretary of State on the recommendation of a Government Department.

PENALTIES.

10. (1) Where any aircraft flies in contravention of, or fails to comply with, these regu-

lations or any provision thereof, the owner of the aircraft, and also the pilot or commander, shall be deemed to have contravened, or, as the case may be, failed to comply with these regulations:

Provided that it shall be a good defence to any proceedings for contravention or failure to comply with these regulations if the contravention or failure is proved to have been due to stress of weather or other unavoidable cause.

(2) If any person obstructs or impedes any person acting under the authority of the Secretary of State in the exercise of his powers and duties under these regulations, such first-mentioned person shall be deemed to have acted in contravention of these regulations.

(3) Any person contravening or failing to comply with these regulations or any provision thereof is liable to imprisonment for a term not exceeding six months or to a fine not exceeding two hundred pounds, or to both such imprisonment and fine.

(5) If any person in any aircraft is guilty of any act of espionage to which the provisions of section one of the Official Secrets Act, 1911, apply, he is liable to penal servitude for a term not exceeding seven years.

INTERPRETATION.

12. In these regulations, unless the context otherwise requires—

“Aircraft” includes airships and flying machines, all balloons, whether fixed or free, and kites;

“Military aircraft” includes naval, military, and air-force aircraft;

“Personnel” (in relation to any aircraft) includes any pilot, commander, navigator, and engineer, and any operative member of the crew;

The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the purpose of the interpretation of an Act of Parliament, and as if these regulations were an Act of Parliament.

SHORT TITLE.

14. These regulations may be cited as the Air Navigation Regulations, 1919.

WINSTON S. CHURCHILL,
One of His Majesty's Principal Secretaries of State.

Air Ministry, London,
30th April, 1919.

MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919. **CHAPTER 38.**

AN ACT TO MAKE FURTHER PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

August, 15th 1919.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. (1) Every sea-going British ship registered in the United Kingdom being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with one or more, certified operators and watchers, at least, in accordance with those rules:

Provided that the Board of Trade may exempt from the obligations imposed by this Act any ships or classes of ships if they are of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Board of Trade, in consultation with the Postmaster-General, shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Act, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Board of Trade to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Act.

(5) The obligations imposed by this Act shall not come into operation while the obligations with respect to wireless telegraphy on ships imposed by the Defence of the Realm Regula-

tions remain in force, but shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Wireless Telegraphy Act, 1904, or any Order in Council, or regulations made thereunder, or by the Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Act shall, as from a date three months after the coming into operation of the obligations imposed by this Act on British ships registered in the United Kingdom, apply to ships other than British ships registered in the United Kingdom while they are within any port in the United Kingdom in like manner as they apply to British ships so registered.

3 (1) This Act may be cited as the Merchant Shipping (Wireless Telegraphy) Act, 1919, and the Merchant Shipping Acts, 1894 to 1916, and this Act may be cited together as the Merchant Shipping Acts, 1894 to 1919.

(2) This Act shall be construed as one with the Merchant Shipping Act, 1894, and "passenger steamer" shall mean a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed under section twenty of the Merchant Shipping (Convention) Act, 1914, for the purposes therein mentioned.

J THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES, 1920, DATED JULY 10TH, 1920, MADE BY THE BOARD OF TRADE UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919 (9 & 10 GEO. 5, C. 38).

The Board of Trade hereby make the following rules under the provisions of the Merchant Shipping (Wireless Telegraphy) Act, 1919.

Dated this tenth day of July, 1920.

H. A. PAYNE,

Secretary to the Board of Trade.

INTERPRETATION.

1. In these Rules—

The expression "coasting trade" means trade exclusively carried on between ports in the British Islands.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade,

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying

50 persons or more.

Class III—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1921 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal condition and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for Ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch :—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(a) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators of whom one shall hold a First or a Second Grade certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS AND WATCHERS.
(a) Voyage exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and two watchers.

(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port. One operator who shall hold a First or a Second Grade certificate, and one watcher.

(c) Voyage not exceeding 8 hours from port to port. One operator who shall hold a First or a Second Grade certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade and the Postmaster-General a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid :—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus :—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(a) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a First Grade certificate.
(b) Voyage not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Board of Trade and the Postmaster-General, the operator shall not while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

QUALIFICATIONS OF OPERATORS.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Postmaster-General with the concurrence of the Board or Trade and watchers shall be certificated by the Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid :—

Schedule.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° East	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

(i) An operator who holds the Postmaster-General's First Class certificate of Proficiency and who has had three years experience as an operator may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these Rules to carry three operators.

(ii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade certificate.

(iii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade certificate.

11. The Postmaster-General may accept certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of September, 1920.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

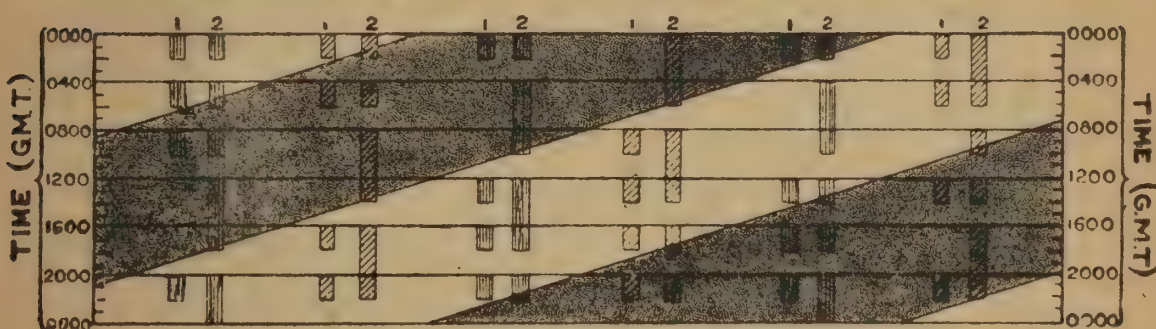
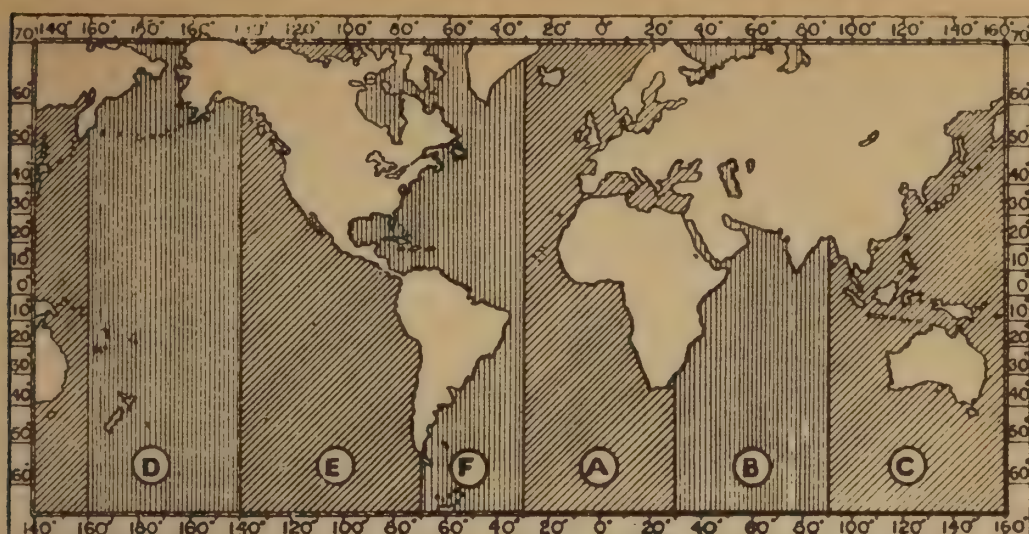
K N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR SENDING AND RECEIVING.
Summary of Conditions of Issue.

NOTE.—All sending stations must also be equipped for reception.

I. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be furnished if possible, but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals on behalf of the company, etc. Any permit granted will be issued in his name, and he will be personally responsible for the observance of its terms.



2. The installation shall be subject to the approval of the Postmaster-General, and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some definite object of scientific value or general public utility. If scientific research is intended they should be certified as competent investigators by a Government department or some recognised scientific body.

5. Each sending station must be under the charge of a person who has satisfied the Postmaster-General, by examination or otherwise, that he has attained:—

(a) Sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.

(b) An operating speed of at least 12 words (Morse) a minute, sending and receiving. This qualification is necessary even when wireless telephony only is used in order that the person in charge of the station may be in a position to act upon instructions in the Morse code issued by Government and commercial stations.

A fee of 5s. will be charged for the examination referred to above when necessary.

The person in charge of a sending station must also make himself acquainted with the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. This information is contained in Section V of the Postmaster-General's Handbook for Wireless Operators, which may be obtained through any bookseller, or direct from the Stationery Office, price 9d., postage 2d.

A licensee not possessing the necessary operating qualifications may be allowed, exceptionally, to employ a qualified operator to work the sending apparatus.

6. Small fees are payable in order to cover the Post Office expenses in connection with the grant of a permit and subsequent inspection, etc., of the station. For each station authorised to use power up to 10 watts the charges, which will cover the use of receiving as well as sending apparatus, will comprise an initial licensing fee of 10s. plus an annual fee of £1, payable in advance (i.e. 30s. for the first year and £1 for each succeeding year). Higher fees will be charged for more powerful stations.

7. *Aerials*.—Dimensions allowed are as follows:—Combined height and length not to exceed 100 feet.

8. *Portable Stations* (i.e., field stations).—General conditions same as for fixed stations.

Power of portable sending stations will usually be limited to 10 watts.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless sending and receiving apparatus should complete the form of application forwarded herewith and return it to the Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, etc.

The fee should not be forwarded until formal application is made for it.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

L N.F.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR RECEIVING.

Summary of Conditions of Issue.

1. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should

be furnished if possible; but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals. Any permit granted will be issued in his name, and he will be personally responsible for the observance of its terms.

2. The installation shall be subject to the approval of the Postmaster-General, and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some object of scientific value or general public utility and that they are competent to carry out experiments in wireless reception.

5. The apparatus shall be used in such a manner as to cause no interference with other stations. In particular, between the hours of 5 p.m. and 11 p.m. on week days and all day Sunday, any oscillating valve or valve circuit employing magnetic or electrostatic reaction must be directly coupled to the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled to the aerial secondary circuit over the range of wavelengths between 300 and 500 metres is similarly restricted.

That is to say:—

(1) Any reactive arrangement or a separate heterodyne oscillator may be used directly coupled to the aerial or the aerial secondary circuit on all waves at all times, with the exception of the range of wavelengths between 300 and 500 metres provided no interference is caused with other stations.

(2) For the range of wavelengths between 300 and 500 metres—

(a) The use of reaction or a separate heterodyne oscillator as in (1) is permissible between the hours 11 p.m. and midnight and from midnight till 5 p.m., Sundays excluded.

(b) The use of reaction or a separate heterodyne oscillator directly coupled to the aerial or the aerial secondary circuit is not permissible between the hours of 5 p.m. and 11 p.m. on weekdays and all day Sunday. If the use of reaction or a separate heterodyne oscillator is desired on these waves during these hours, the reaction or separate heterodyne oscillator must be so arranged that a valve is interposed between the aerial circuit or circuits and the circuit to which the reaction or separate heterodyne oscillator is coupled.

6. A fee of 10s. in respect of each experimental station is payable annually in advance so long as the licence remains in force.

The period covered by the first payment expires as follows:—

If the licence is taken out during the three months ended:

31st March—on the 31st December in the same year.

30th June—on the 31st March in the following year.

30th Sept.—on the 30th June in the following year.

31st Dec.—on the 30th September in the following year.

7. *Aerials*.—Dimensions allowed are as follows: Combined height and length not to exceed 100 feet.

8. *Portable Stations (i.e., field stations)*.—General conditions same as for fixed stations.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless receiving apparatus should complete the form of application forwarded herewith and return it to The Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, etc.

The fee should not be forwarded until formal application is made for it.

THIS FORM IS NOT APPLICABLE TO A LICENCE FOR THE RECEPTION OF BROADCAST MATTER. SUCH LICENCES MAY BE OBTAINED AT A HEAD OR BRANCH POST OFFICE.

Regd. No.

WIRELESS TELEGRAPHY ACT, 1904.

APPLICATION FOR AUTHORITY TO USE RECEIVING APPARATUS.

N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy may be installed or worked.

1. (a) Name of applicant (with Christian names in full)

Occupation

Address

(b) Is the applicant a British subject? (Evidence of British nationality and two written references as to character should be enclosed)

(c) If the applicant is under 21 years of age the following questions should be answered:—

* Name of parent or guardian (with Christian names in full).

Whether British subject or not (evidence and references as under 1 (b) to be furnished).

Relationship (if any) to applicant.

Occupation

Address

2. (a) Scientific qualifications (if any) of applicant

(b) Particulars of any experience in working wireless apparatus.

(c) Particulars of any certificate of proficiency in radiotelegraphy from the Postmaster-General and service in wireless branches of Navy, Army, or Air Force.

3. Full address of the station or stations at which wireless apparatus would be installed.

4. Particulars of the nature and object of the experiments which it is desired to conduct with the apparatus.

(General statements such as "Wireless Telephony," "Improvements in efficiency," etc., are not sufficient).

5. Is it desired to use the station for the reception of programmes transmitted by British broadcasting stations?

†6. Description of apparatus to be used.

†7. Sketch of aerial which it is desired to use (showing height and dimensions, including leading-in wires).

Signature of applicant

*If the applicant is under 21 years of age, any permit granted will be issued in the name of his parent or guardian, who will be personally responsible for the observance of its terms. Evidence of British nationality and references should be furnished both in respect of the applicant and of his parent or guardian.

(In the case of portable (outdoor) stations, the proposed area of operation should be stated. This should be defined as within a radius of 10 miles of a special point).

†N.B.—If more than one station, give particulars in respect of each station.

Date
Counter signature of parent or guardian if the applicant is a minor :—

.....
Date

Your reference.
P.O. reference, 192

All communications
should be addressed
to—

"The Secretary,
General Post Office,"

Sir,

RECEPTION OF WIRELESS SIGNALS.

With reference to your letter of the
I am directed by the Postmaster-General to say that, pending the issue of a formal licence, he authorises you, on the conditions specified overleaf, to install and use a station for receiving wireless signals for experimental purposes at

.....
This permit is subject to withdrawal or modification at any time, either by specific notice in writing sent to you by post at the address shown above or by means of a general notice in the *London Gazette* addressed to all holders of licences for experimental wireless telegraph receiving stations.

I am, Sir,

Your obedient Servant,
for the Secretary.

CONDITIONS.

1. The licensee shall not allow the station to be used for any purpose other than that of receiving messages.

2. The station shall be subject to the approval of the Postmaster-General and shall be open to inspection at all reasonable times by duly authorised officers of the Post Office.

3. The combined height and length of the external aerial (where one is employed) shall not exceed 100 feet.

4. The station shall not be used in such a manner as to cause interference with other stations. In particular, between the hours of 5 p.m. and 11 p.m. on weekdays and all day Sunday, any oscillating valve or valve circuit employing magnetic or electrostatic reaction must not be directly coupled to the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres. The use of separate heterodyne circuits coupled to the aerial or the aerial secondary circuit over the range of wavelengths between 300 and 500 metres is similarly restricted.

5. The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever of any message received by means of his apparatus, except messages in connection with his experiments received from another experimental station, time signals, musical performances and messages transmitted for general information.

6. A fee of 10s. is payable annually in advance so long as the licence remains in force.

The period covered by the first payment expires as follows :—

If the licence is taken out during the three months ended—

31st March—on the 31st December in the same year.

30th June —on the 31st March in the following year.

30th Sept. —on the 30th June in the following year.

31st Dec. —on the 30th September in the following year.

7. Any breach of the foregoing conditions will render it necessary for this permit to be cancelled.

M EXTRACT FROM CONVENTION RELATING TO INTERNATIONAL AIR NAVIGATION (1919) :—

ART. 14.—No wireless apparatus shall be carried without a special licence issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special licence for the purpose.

Every aircraft used in public transport and capable of carrying ten or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

N LICENCE TO ESTABLISH WIRELESS TELEGRAPH AIRCRAFT STATIONS.

To all to whom these presents shall concern I, the Right Honourable

His Majesty's Postmaster-General send greeting :

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the United Kingdom or in any British aircraft except under and in accordance with a licence granted in that behalf by the Postmaster-General :

And whereas

(hereinafter

called "the licensee") has applied to the Postmaster-General for the grant of a licence to establish install and work apparatus for wireless telegraphy as defined in Section I (7) of the Wireless Telegraphy Act 1904 at the aircraft station or stations mentioned in the First Schedule hereto :

Now I the above-named

His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the thirty-first day of December one thousand nine hundred and unless and until these presents and the licence or permission hereby given shall be determined as hereinafter provided licence and permission—

I. To establish install and work for the purposes hereinafter mentioned at the aircraft station or stations specified in the First Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedules hereto (which apparatus is hereinafter referred to as "the licensed apparatus") ;

II. To send and receive messages by means of the licensed apparatus for the purposes and subject in all respects to the conditions and restrictions contained in the Second Schedule hereto.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions :—

1. In these presents (and in the Schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something

either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships or aircraft of His Majesty's Navy between ships or aircraft of His Majesty's Navy and Naval stations or between a ship or aircraft of His Majesty's Navy or a Naval station and any other wireless telegraph station.

The expression "Government aircraft signalling" means signalling by means of any system of wireless telegraphy between two or more Government aircraft between any Government aircraft and any wireless station or between any Government aerodrome and any other wireless station.

The expressions "the International Telegraph Convention" and the "International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The term "aircraft" includes all balloons, whether fixed or free, airships and flying machines.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this licence.

3.—(1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling or Government aircraft signalling.

(2) Whenever the operators at any signal station of the licensees perceive through the medium of the instruments used by them that Naval signalling or Government aircraft signalling is proceeding they shall refrain from using the licensed apparatus until all indication that Naval signalling or Government aircraft signalling is proceeding shall have ceased.

(3) These provisions for the protection of Naval signalling or Government aircraft signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to

1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912 so far as they are not inconsistent with the other provisions of this licence the expressions "ship" and "ship station" in the Convention being read as if "aircraft" and "aircraft station" respectively were substituted therefor.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensee shall comply in all respects with all such directions and regulations as may from time to time be given or made by the Secretary of State for Air.

9. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

10. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any Corporation Company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. The licensee shall so far as possible receive from aircraft ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12.—(1) The licensed apparatus at each of the aircraft stations mentioned in the First Schedule hereto shall be worked only by operators holding Air Operators' certificates issued by the Postmaster-General and such operators shall only work the apparatus in accordance with the tenor of the certificate which they hold and subject in all respects to the conditions of this licence.

(2) Air Operators' Certificates will be of two classes. A First Class Certificate authorising the holder to work wireless apparatus on aircraft for the sending or receiving of messages in general and a Second Class Certificate authorising the holder to work wireless apparatus on aircraft for the purpose of sending and receiving spoken messages only. Such certificates will be granted to approved natural-born British subjects of such technical proficiency and will be in such form and will be subject to such conditions as the Postmaster-General shall from time to time prescribe and they may be endorsed or withdrawn at the discretion of the Postmaster-General in accordance with the conditions to which the certificates respectively are subject.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the stations specified in the Schedule hereto a copy of Section 11 of the Post

Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this licence.

14. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the aircraft stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

15. The licensee shall carry on every aircraft on which an aircraft station is established under this licence a print or copy of the licence certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the aircraft calls.

16. The licensee shall forthwith pay to the Postmaster-General for and in respect of the licence hereby granted a royalty of per annum in respect of each aircraft station at which the licensed apparatus is installed.

17. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences powers or authorities hereby granted or any of such licences powers or authorities.

18.—(1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Air or Police Officer or any other person authorised by the Secretary of State for Air to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any aircraft on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any aircraft on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so

authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

19. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

20. In the case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions or conditions herein contained then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licences powers and authorities hereinbefore granted and each and every of them as to all or any of the aircraft stations hereby licensed and thereupon these presents and the said licences powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said aircraft stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit, And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

22. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

As witness my hand and seal this
day of one thousand nine
hundred and

FIRST SCHEDULE.

[illegible]

SECOND SCHEDULE.

PROVISIONS AS REGARDS QUALITIES OF APPARATUS AND CONDITIONS OF WORKING.

1. The licensed apparatus shall be in keeping with scientific and technical requirements as determined by the Postmaster-General from time to time and shall comprise apparatus for sending and receiving messages. The licensed apparatus at each aircraft station shall be properly adjusted in all respects before the aircraft commences its flight.

2. The receiving apparatus at each aircraft station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of messages.

3. The sending apparatus installed at each aircraft station shall be so constructed as to be capable of using waves of 600 metres interrupted-continuous wave (hereinafter referred to as "the Aircraft Ship Wave") and 900 metres continuous wave (hereinafter referred to as "the Aircraft Normal Wave"). It may also be constructed so as to be capable of using the following waves, viz.—220, 300, 450 and 800 metres interrupted-continuous waves and 200 to 500 metres, 650 to 950 metres and 2,000 to 3,000 metres continuous waves: Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres, it must also be capable of using 2,400 metres continuous wave: Provided further that the wavelengths before referred to shall not be used without the written permission of the Postmaster-General.

The use of the Aircraft Ship Wave shall be confined to the system known as interrupted continuous wave (*i.e.*, Tonic Train or modulated by abrupt interruptions) save in the case of exceptional emergency, when, if the use of this system be impracticable the wave may be used for the sending and receipt of spoken messages. The aircraft Normal Wave shall be used only for continuous undamped waves or for the purpose of sending and receiving spoken messages.

4. The wavelengths referred to in this Schedule shall be measured by the standard of measure-

ment for the time being in use by the Postmaster-General.

5. The sending apparatus installed at each aircraft station may be so constructed as to be capable of varying the wave emitted by an amount equal to but not exceeding 3,000 cycles per second above and below the frequency of the normal wave in use: Provided always that such variation from the normal wave shall be used only—

(a) When first calling up ;

() When communication has not been established when first calling up; or

(c) In case of distress.

6. The receiving apparatus installed at each aircraft station may be constructed so as to receive waves of any length, but it shall be constructed so as to be capable of receiving messages on the Aircraft Ship Wave and the Aircraft Normal Wave: Provided always that if the sending apparatus shall be capable of using the wavelengths mentioned in paragraph 3 of this Schedule the receiving apparatus shall be so constructed as to be capable of receiving messages on these wavelengths.

7. The input of power to the licensed apparatus shall not exceed 100 watts. Power in continuous wave or interrupted continuous wave sets in the case of valve transmitters is the power in the anode circuit, and in high frequency alternations the power put into the alternator.

8. The licensed apparatus shall not be used except during actual flight or in case of forced landing.

9. The licensed apparatus may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

(1) Distress signals;

(:) Meteorological information ;

(c) Forced landings and landing instructions;

(d) Positions ;

(e) Supply of fuel and spare parts;

(f) Origin, destination, or course of flight.

10. Except with the written permission of the Postmaster-General, the Aircraft Normal Wave and no other wave shall be used for the sending and receipt of messages to and from—

(a) Other aircraft stations;

(b) Ground stations specified by the Secretary of State for Air.

11. Except with the written permission of the Postmaster-General, the Aircraft Ship Wave and no other wave shall be used for the sending and receipt—

(a) Of messages to and from ships of His Majesty's fleet and merchant ships;

(b) Of such messages as are rendered necessary by reason of exceptional emergency and not coming within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave.

12. The procedure employed for the sending and receipt of messages to and from each aircraft station and other aircraft stations shall conform to instructions laid down by the Secretary of State for Air.

Signed sealed and delivered by
in the presence of

On behalf of the Postmaster-General.

O WIRELESS DIRECTION FINDING STATIONS.

USE BY THE MERCANTILE MARINER.
ADMIRALTY NOTICE TO MARINERS, No. 524 OF
25TH MARCH, 1920.

The following is promulgated for information:—

The Admiralty have recently received evidence from various sources that the existence of Wireless Direction Finding Stations in the United Kingdom, France, Canada, the United States and Germany, and the regulations under which these stations are operated, are not as generally known throughout the Mercantile Marine as is desirable in view of the immense value of the system of wireless direction finding as an aid to navigation, especially in thick and foggy weather.

2. On the other hand, returns rendered by the stations in the United Kingdom show that where the system is known to masters it is beginning to be more extensively used, not only when atmospheric conditions render it impossible to obtain the ship's position by any other means, but as a check on positions obtained by the ordinary method of navigation.

3. Information on this subject was first published in Admiralty Notice to Mariners No. 1,019 of May 23rd, 1919. This Notice has since been revised, and the latest information on the subject is contained in Admiralty Notice to Mariners No. 363 of the year 1920 (reproduced in Board of Trade Notice to Mariners). This Notice should be studied by masters who desire to make use of this system; the procedure to be adopted, which varies to some extent for the different stations and as to the wavelength to be used, is set out therein in detail. It is equally necessary that W/T operators should study the procedure.

4. Briefly put, a ship requiring a bearing calls up the D.F. station or stations from which it is desired to receive a bearing, singly or together, according to the procedure laid down. The station or stations reply with the bearing (true) of the ship from that station.

5. The following stations are established in the United Kingdom: Berwick, Flamborough, Lizard, Carnsore.

6. These stations are operated by the Royal Navy, but are available for the use of the Mercantile Marine.

7. A charge of five shillings (5s.) will be made as from April 1st, 1920, for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

8. Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

9. The accuracy with which bearings can be taken depends on certain conditions outlined in the Notice to Mariners referred to, but, although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given from any failure in the service, or from any other cause whatever.

(Notice No. 524 of 1920, dated March 25th.)

Authority.—The Lords Commissioners of the Admiralty. (H. 2049/20.)

P WIRELESS DIRECTION FINDING STATIONS.

(See under Great Britain in Direction Finding Section.)

Q ADMIRALTY NOTICE TO MARINERS.

No. 952 OF JUNE 15TH, 1920.

(See under Great Britain in Direction Finding Section.)

R AIR MINISTRY NOTICE TO AIRMEN.

No. 103 OF SEPTEMBER, 30TH, 1920.

(See under Great Britain in Direction Finding Section.)

WIRELESS TELEGRAPHY AND SIGNALLING.

A BILL

S To Amend the Wireless Telegraphy Act, 1904, and to make further provision with respect to the regulation of Wireless Telegraphy and Visual and Sound Signalling.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as, follows:—

1. The Wireless Telegraphy Act, 1904 (hereinafter referred to as the principal Act), shall become a permanent Act, and any provision in any Act in force at the time of the passing of this Act which limits the period for which the principal Act is to remain in force shall cease to have effect.

2. (1) The Postmaster-General may, notwithstanding anything in the principal Act, make regulations—

(a) As to the terms, conditions, and restrictions on or subject to which licences or any class of licence under the principal Act are to be granted, renewed, suspended, or withdrawn; and

(b) Requiring any operators or other persons engaged in the working of wireless telegraphy to be provided with certificates, and making provision as to the manner and conditions of the issue and renewal of any such certificate, including the examination, and tests to be undergone, and the form, custody, production, cancellation, suspensions endorsement and surrender of any such certificate, whether issued before or after the passing of this Act; and

(c) For preventing interference with the working of wireless telegraphy by the generation or use of etheric waves for any purpose other than the transmission or reception of wireless messages; and

(d) For giving effect to, and securing compliance with, the provision of any international convention signed on behalf of His Majesty, and any regulations made thereunder, so far as the same relate to wireless telegraphy; and

(e) Prescribing, subject to the consent of the Treasury, the fees to be paid in respect of the grant or renewal of any licence or certificate.

(2) Regulations under this section may provide that any person acting in contravention of or failing to comply with the regulations or any of them, or the terms, conditions and restrictions or any of them, on or subject to which any such licence or certificate as aforesaid has been granted, shall be liable, on summary conviction, to imprisonment for a term not exceeding three months, or to a fine not exceeding fifty pounds, and, in the case of a continuing offence, a further fine not exceeding five pounds for each day during which the offence continues.

(3) Subsection (6) of section 1 of the principal Act is hereby repealed.

3. Subsection (1) of section 2 of the principal Act, which makes special provision as to licences for experimental purposes, shall cease to have effect, and licences for those purposes shall be subject to the general provisions as to licences for wireless telegraphy contained in section 1 of the principal Act.

4. (1) A person shall not—

(a) Send or attempt to send by wireless telegraphy a message or communication of an indecent, obscene, or offensive character; or

(b) Send or attempt to send by wireless telegraphy a signal of distress of a false or misleading character, or a false or misleading message as to a vessel in distress; or

(c) Improperly divulge the purport of any message sent or proposed to be sent by wireless telegraphy.

(2) If any person acts in contravention of this section he shall be liable on summary conviction to a fine not exceeding ten pounds, or on conviction on indictment to imprisonment for a term not exceeding twelve months.

5. The penalty to which a person is liable on summary conviction for an offence under subsection (3) of section 1 of the principal Act shall be imprisonment for a term not exceeding three months, or a fine not exceeding fifty pounds, and, in the case of a continuing offence, a further fine not exceeding five pounds for each day during which the offence continues.

6. Any provisions of the principal Act or this Act which are applicable to ships, shall apply also to aircraft, with the necessary modifications, and in particular with the following modifications:—

(1) For the reference to British ships in the territorial waters abutting on the coast of the

British Islands there shall be substituted a reference to British aircraft in or over the British Islands and in or over the territorial waters abutting on the coast thereof; and—

(2) For the reference to British ships whilst on the high seas there shall be substituted a reference to British aircraft outside the British Islands and the territorial waters abutting on the coast thereof; and

(3) For the reference to a foreign ship in territorial waters there shall be substituted a reference to a foreign aircraft whilst in or over the British Islands or the territorial waters abutting on the coast thereof; and

(4) Subsection (5) of section (1) of the principal Act as amended by this Act shall not apply.

7. (1) The provisions of the principal Act as amended by this Act shall apply to any visual or sound signalling station used or intended to be used for the purpose of communication from the British Islands with ships at sea as they apply to wireless telegraphy stations.

(2) For the purposes of this section "visual or sound signalling station" includes any permanent or fixed apparatus for the purpose of visual or sound signalling, and the provisions of the principal Act and this Act shall apply to the maintenance of any visual or sound signalling station in existence at the time of the passing of this Act as they apply to the establishment of a visual or sound signalling station:

Provided that nothing in the principal Act or this Act shall apply to visual or sound signalling stations or apparatus on ships or aircraft, or to any signal station established by Lloyd's under the powers conferred by the Lloyd's Signalling Stations Act, 1888, or to signalling stations and lighthouses under the control of the Board of Trade or of any General or Local Lighthouse Authority.

8. If at any time in the opinion of a Secretary of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission and reception of messages by wireless telegraphy or visual or sound signalling, and notice to that effect is published in *The Gazette*, it shall be lawful for the Postmaster-General during the continuance of the emergency to make such rules as appear necessary with respect to the possession, sale, purchase, construction, and use of apparatus for wireless telegraphy or visual or sound signalling, or component parts of such apparatus, and to impose penalties and forfeitures in respect of any breach of the rules, and make such further provision as appears necessary for the enforcement of the rules:—

Provided that—

(a) Rules under this section shall not provide for the imposition of a term of imprisonment exceeding six months, or a fine exceeding one hundred pounds, or, in the case of a continuing offence, ten pounds for each day during which the offence continues; and

(b) Any rules made under this section shall be laid as soon as may be before both Houses of Parliament.

9. The principal Act as amended by this Act shall not extend to British ships or British aircraft registered outside the British Islands, except that any such ships or aircraft shall, whilst in or over the British Islands or the territorial waters abutting on the coast thereof, be subject to the provisions of the principal Act as so amended with respect to foreign ships and aircraft in like circumstances.

Provided that if after the establishment of the Irish Free State the legislature thereof

makes other provision with respect to ships and aircraft registered in the Irish Free State and with respect to ships and aircraft when in or over the Irish Free State, or the territorial waters abutting on the coast thereof, the foregoing provisions of this section shall have effect as if the expression "British Islands" did not include the Irish Free State, and the principal Act as amended by this Act shall cease to apply to foreign ships and aircraft when in or over the Irish Free State or the territorial waters abutting on the coast thereof.

10. (1) This Act may be cited as the Wireless Telegraphy and Signalling Act, 1922, and shall be construed as one with the principal Act, and the principal Act and this Act may be cited together as the Wireless Telegraphy and Signalling Acts, 1904 and 1922.

(2) Any reference in this Act to the principal Act or any provision thereof shall unless, the contrary intention appears, be construed as a reference to that Act or provision as amended by this Act.

T BROADCAST LICENCE.

WIRELESS TELEGRAPHY ACT, 1904.

Licence to Establish a Wireless Receiving Station.

Mr.....
is hereby authorised (subject in all respects to the conditions set forth on the back hereof) to establish a wireless station for the purpose of receiving messages at.....
for a period ending on the.....next.
The payment of the fee of ten shillings is hereby acknowledged.

Dated..... day of

.....192 ..

Issued on behalf of the Post-

master-General

.....
for Postmaster.

Signature of Licensee

.....

Stamp of
Issuing Office.

If it is desired to continue to maintain the station after the date of expiration a fresh licence must be taken out within 14 days. Heavy penalties are prescribed by the Wireless Telegraphy Act, 1904, on conviction of the offence of establishing a wireless station without the Postmaster-General's licence.

CONDITIONS.

1. The licensee shall not allow the station to be used for any purpose other than that of receiving messages.

2. Any receiving set and any of the following parts, viz.: Amplifiers (valve or other), telephone head receivers, loud speakers and valves, used under this licence must bear the mark shown in the margin.

3. The station shall not be used in such a manner as to cause interference with the working of other stations. In particular valves must not be so connected as to be capable of causing the aerial to oscillate.

4. The combined height and length of the external aerial (where one is employed) shall not exceed 100 feet.

5. The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal) or make any use whatsoever, of any message received by means of the station other than time signals, musical performances and messages transmitted for general reception.

6. The station shall be open to inspection at all reasonable times by duly authorised officers of the Post Office.

7. This licence may be cancelled by the Postmaster-General at any time either by specific notice in writing sent by post to the licensee at the address shown hereon, or by means of a general notice in the *London Gazette* addressed to all holders of wireless receiving licences for broadcast messages.

N.B.—Licences may only be held by persons who are of full age, and any change of address must be promptly communicated to the issuing Postmaster.

A.....

GENERAL POST OFFICE.

ENGINEERING DEPARTMENT.

U *Conditions which Broadcast Receivers should fulfil to obtain Post Office approval.*

1. All types of broadcast receivers may be constructed for the reception of signals of any wavelength.

2. The apparatus shall be so constructed that it is difficult to change the arrangement of the circuits embodied in the design by means of external connections.

3. The following units, each of which must consist of apparatus assembled connected and mounted in a single container, shall be approved.

(a) Combined tuner and rectifier.

(b) Combined tuner, high frequency amplifier and rectifier.

(c) Audio frequency amplifier (of valve or other type).

(d) Tuner, rectifier and audio frequency amplifiers.

(e) Tuner, high frequency amplifiers, rectifier and audio frequency amplifiers.

In particular, it is intended that the Aerial Tuning Capacity and the Aerial Tuning Inductance required to cover the "Broadcast" band must be included in the container and that each panel must contain all the High Frequency Circuits and the High Frequency Amplifiers in association with the Rectifier, but there is no limit to the number of High Frequency or Audio Frequency Amplifiers that may be included in any unit or set provided the other conditions set forth herein are complied with. There is no objection to provision being made for the insertion of additional inductance or capacity to the units for the reception of signals outside the "Broadcast" band of wavelengths. Audio Frequency Amplifiers may be added in single, double or multiple units to (a) and (b).

Telephone Head Receivers, Loud Speakers and Valves are regarded as wireless accessories, and it is not necessary for such items to be submitted for approval nor to be marked with a Post Office registered number. It is necessary, however, for such accessories intended for use with Broadcast Receivers to bear the registered trade mark of the British Broadcasting Company.

4. No receiving apparatus for general broadcast purposes shall contain a valve or valves so connected as to be capable of causing the aerial to oscillate.

5. Where reaction is used on to the first receiving circuit it must not be adjustable, but must be fixed and incapable of causing oscillation.

6. Where reaction is used between a second or subsequent valve on to the anode circuit of a valve connected to the aerial, either directly or inductively, and no specific coupling tending to produce oscillations in the aerial is provided between the first receiving circuit and the first anode circuit, the reaction may be adjustable.

7. Tests of sets will be made on two aerials, one 30 feet long and the other 100 feet long. On these aerials the sets must be capable of receiving over the whole range of wavelengths covered by the "Broadcast" band, viz., 350 to 425 metres.

8. The sets will be tested for the production of oscillations in the aerial, and for interference properties with a factor of safety, *i.e.*, increasing the high tension battery by about 30 per cent., changing valves, etc., but not by altering any soldered connections.

9. The Postmaster-General must be satisfied that sets containing reaction can be reasonably repeated with consistent conditions.

10. After approval, the type will be given a Post Office registered number, and makers must see that the sets fulfil the non-interfering conditions before they are sold. All sets sold for use under the broadcast receiving licence shall bear the registered trade mark of the British Broadcasting Company and the Post Office registered number.

11. The unit or set approved as the pattern instrument of a type shall be retained without alteration by the maker. The Postmaster-General shall have the right at any time to select any set of an approved type for test to see that the set is reasonably similar to the approved pattern. In the case of sets of an approved type employing reaction being found to oscillate the aerial, the Post Office may cancel the authorisation of the future sale of that type. No change in the design of any set or unit may be made after approval without the previous sanction of the Postmaster-General.

Note.—The approval of the Postmaster-General does not carry any implied guarantee of the quality, workmanship or sensitivity of the apparatus.

Firms desiring to submit apparatus for approval and registration should send a sample set of each type, together with relative wiring diagrams, preferably of foolscap size, to the Engineer-in-Chief, Wireless Section, Room, 1A 5th Floor, General Post Office (North), London, E.C.1. Batteries, Valves and Telephone Receivers need not be sent with the apparatus for test, these accessories will be provided by the Post Office. After tests the firms will be notified of the result and advised that the sets are ready for collection.

REPORT OF THE BROADCASTING COMMITTEE.

V The Committee appointed by the Postmaster-General on April 24th, 1923, to consider questions relating to broadcasting, issued their report on August 23rd, 1923. The full report is published by H.M. Stationery Office, and deals with a great number of subjects connected with broadcasting.

The scheme recommended is summarised as follows:—

That a Broadcasting Board should be established by statute to assist the Postmaster-General in the administration of broadcasting and to advise him on important questions concerning the service.

That the broadcasting service should not be operated by a Government Department, but that those entrusted with the service should work under Government licence.

That it is desirable that the operation of the existing service by the British Broadcasting Company should be continued for a definite period, subject to agreed modifications in the Company's licence, but that, subject to existing rights, the Government should keep its hands free to grant additional licences, and should

consider various alternatives for the operation in the future, either by the Company or by other authorities, of local or relay stations in addition to large stations.

That no part of the cost of broadcasting should fall on the taxpayer, but that the Government should not endeavour to make a profit on the administration of the service.

That the bulk of the revenue required for the service should be obtained from the receiving licence fee, which should be retained at 10s. a year, subject to consideration of a reduction in the event of more revenue being received than is sufficient to carry on an adequate service.

That instead of 5s. as much as 7s. 6d. out of the 10s. fee might be allocated under any new scheme to meet the cost of broadcasting, subject to a sliding scale under which the payment per licence would decrease as the number of licences increased.

That certain supplementary sources of revenue should be the subject of early consideration.

That in place of the present broadcast and experimental receiving licences a uniform and simple type of licence be issued and placed on sale at Post Offices without any formalities, containing a clause forbidding improper use of back-coupling on pain of withdrawal of the licence, but no other limitation on the apparatus allowed to be used.

That effective measures be taken to enforce such a licence, and that certain additional statutory powers be obtained to strengthen the Postmaster-General's hands.

That the immediate application of the recommended scheme is most desirable.

That in consideration of the recommended modifications in the existing Agreement, the British Broadcasting Company should be given an increased share of the receiving licence fees and a two-years' extension of their own licence, on modified terms, if they will agree to the immediate application of the scheme, and to certain alterations in their Articles of Association, but with retention of the limitation of dividends.

That the Committee is unable to make any recommendation on the desire which has been expressed for the protection of the manufacturing industry against foreign competition, feeling that, although it was an object of the existing scheme, it must be left to be dealt with by Parliament as part of the fiscal policy of the country.

That arrangements be made for the greatest possible extension of the existing broadcast band of wavelengths (350 to 425 metres), preferably by the allocation of a band from 300 to 500, excluding 440 to 460 metres.

That all possible steps be taken to protect the band allocated to broadcasting from interference by other services.

That the present restriction of the hours of broadcasting be removed, thus enabling additional facilities to be provided.

That the British Broadcasting Company have achieved a large measure of success in gauging the public taste and providing satisfactory programmes.

That there should be a gradual extension of the broadcasting of news, under proper safeguards, and that more latitude should be given for the broadcasting of special events without regard to the hour.

That the Postmaster-General should remain the final arbiter when any question is raised as to what kind of matter may or may not be broadcast.

SUGGESTED FORM OF LICENCE.

W The new form of Receiving Licence suggested is printed below :—
 WIRELESS TELEGRAPHY ACT, 1904.
Licence to Establish a Wireless Receiving Station.

Mr. (name in full)

of
 is hereby authorised (subject in all respects to the conditions set forth on the back hereof) to establish a wireless station for the purpose of receiving messages at for a period ending on the next. The payment of the fee of ten shillings is hereby acknowledged.

Dated day of 192 .
 Issued on behalf of the Postmaster-General.

for Postmaster.

Signature of Licensee.

If it is desired to continue to maintain the station after the date of expiration a fresh licence must be taken out within fourteen days. Heavy penalties are prescribed by the Wireless Telegraphy Act, 1904, on conviction of the offence of establishing a wireless station without the Postmaster-General's Licence.

Stamp of
 Issuing Office.

CONDITIONS.

The licensee shall not allow the station to be used for any purpose other than that of receiving messages.

The station shall not be used in such a manner as to cause interference with the working of other stations. In particular back-coupling must not be used to such an extent as to energise any neighbouring aerial.

The combined height and length of the external aerial (where one is employed) shall not exceed 100 ft. An aerial which crosses above or is liable to fall upon or to be blown on to any overhead power wire (including electric lighting and tramway wires) must be guarded to the reasonable satisfaction of the owner of the power wire concerned.

The licensee shall not divulge or allow to be divulged to any person (other than a duly authorised officer of His Majesty's Government or a competent legal tribunal), or make any use whatsoever, of any message received by means of the station other than time signals, musical performances and messages sent for general reception and messages sent solely for experimental purposes from an authorised experimental sending station.

The station shall be open to inspection at all reasonable times by duly authorised officers of the Post Office, who will produce their cards of identity on request.

This licence may be cancelled by the Postmaster-General at any time either by specific notice in writing sent by post to the licensee at the address shown hereon, or by means of a general notice in the *London Gazette* addressed to all holders of wireless receiving licences for broadcast messages, and will be cancelled on breach of any of the foregoing conditions. In the event of cancellation no part of the fee will be returned.

N.B.—Any change of address must be promptly communicated to the issuing Postmaster.

NEW REGULATIONS ISSUED BY THE P.M.G

BASED UPON THE COMMITTEE'S RECOMMENDATIONS.

X In giving instructions for the issue of the Report of the Broadcasting Committee, the Postmaster-General desires to express publicly—as he has already done privately—his warmest thanks to the Committee for the great care which they have given to the consideration of the novel and difficult questions referred to them by his predecessor.

The Report makes the following main recommendations :—

That a Broadcasting Board should be established by Statute.

That the Broadcasting service should not be operated by a Government department and that the existing service of the British Broadcasting Company should be continued and extended for two years upon modified terms.

That one form of licence at a fee of 10s. a year (of which the Broadcasting Company should receive 7s. 6d. and the Government 2s. 6d.) should be issued and placed on sale at Post Offices.

That no protection should be given to the British manufacturers by the licence.

Sir Laming Worthington-Evans finds that it is not possible for the scheme recommended by the Committee to be brought fully into operation immediately. As the Committee themselves point out, it has been necessary to have regard to the existing agreement with the British Broadcasting Company, which does not expire until December 31st, 1924. Under this agreement, and in accordance with the statements made in the House of Commons at the time the manufacturers are entitled to protection, and no licences were intended to be granted to any persons not using sets marked "B.B.C." and manufactured by members of the Company.

The immediate cause of the appointment of the Committee was the deadlock which had arisen between the Post Office and the Company in regard to the proposed introduction of another form of licence, viz., a "Constructor's Licence," to persons who make their own sets or assemble them from ready-made parts, but who do not desire to carry on experiments. These receiving sets were being used contrary to the terms of the agreement. Large numbers of such persons had applied to the Post Office for licences, and probably many others, realising that no licence was in existence appropriate to their case, have been using their apparatus without making application.

The continuance of the present situation would be bad for all parties; the Broadcasting Company because it is losing a revenue upon which it has counted, and the Post Office because, as the Department entrusted with the administration of the law regarding the licensing of wireless apparatus, it is unable to enforce the contemplated restriction.

In these circumstances a compromise has had to be sought. In order to recognise the Company's rights under its agreement and at the same time to meet the views of the Committee as far as immediately practicable, the Postmaster-General has agreed with the Broadcasting Company that a constructor's licence should be issued for a limited period at an annual fee of 15s. (as compared with the fee of 10s. charged for the B.B.C. licence). The additional 5s. for the constructor's licence is justified

because otherwise the constructors would be obtaining the benefit of the Broadcasting Company's programme without making a proportionate contribution to the expense.

The Company have agreed to this arrangement on condition that the licensee gives an undertaking that, in constructing his apparatus, he will not knowingly use parts manufactured elsewhere than in Great Britain or Northern Ireland. In all the circumstances, and especially having regard to the unemployment which at present exists, and which would be accentuated by the importation on any considerable scale of wireless receiving apparatus from abroad, the Postmaster-General has accepted this condition.

There are, however, probably 200,000 persons already in possession of unlicensed receiving apparatus, and as the Committee point out, these persons are paying nothing towards the cost of the programmes because, in the past there has been no licence applicable to them. A special interim licence will be issued at a fee of 15s., covering their present apparatus, whether made or purchased, and wherever made or purchased, which will be granted to them provided that they apply for licences before October 15th. No charge will be made for past use and no proceedings will be taken in respect of past use if the licence is taken out before October 15th.

Constructor's and interim licences as above will be placed on sale at all Head and Branch Post Offices and certain sub-offices on and from October 4th. Applicants for such licences, as well as for the existing B.B.C. licence, will be required to fill up and sign a simple form. Copies of these application forms may be obtained not only at head and branch offices, but at all sub-offices at which money orders are issued.

This system of licensing will be continued for an interim period expiring on December 31st, 1924, after which it will be possible for the single form of licence recommended by the Committee to be introduced, without any condition as to the marking or origin of the licensed apparatus, if it should be then thought desirable.

Out of the fees of 15s. for the constructor's licence and 10s. for the B.B.C. licences, the Company will, if the House of Commons agrees, receive 12s. 6d. and 7s. 6d. respectively, instead of 5s. per licence which they receive under the existing scheme.

The Postmaster-General is not satisfied that, even with the increased contribution from licence fees, the revenue of the Company will, for some time to come, be sufficient to provide adequate programmes without a substantial contribution in the form of royalties on the sale of sets by the manufacturers who form the Company. Hence he has stipulated for the continued payment of such a contribution, but on a reduced scale. The reduction will be approximately 50 per cent., except in the case of crystal receiving sets, where it will be considerably more. This reduction should enable a cut to be made in the cost of receiving sets. The proportion of the licence fees receivable by the Company will after December 31st, 1924, be placed on a sliding scale based on the number of licences on the one hand, and the cost of maintaining an adequate broadcasting service on the other hand. Any surplus profit accruing to the Company over and above 7½ per cent. on its capital and a necessary reserve for depreciation, etc., of plant and machinery will be surrendered to the Post Office; in other words the profits of the Company are limited to 7½ per cent. upon its capital.

The existing experimental licence, at an annual fee of 10s., will continue to be issued from the General Post Office to persons who are able to satisfy the Postmaster-General that they desire the licence for bona fide experimental purposes and are qualified to conduct experiments, and who sign a declaration to the effect that they will not use the broadcast programmes except for experimental purposes.

Each new licence (as distinct from renewed licences) will cover a period of twelve months from the first day of the month of issue. Renewed licences will cover twelve months exactly from the date of expiration of the old licence.

The basis of membership of the Broadcasting Company will be extended so as to include dealers, with suitable representation on the Board of Directors for the new membership if it becomes at all substantial; and the deposit of £50 now required from members will be abolished. The licence held by the Company will be prolonged, on suitable conditions, to the end of 1926, as recommended by the Committee.

If the Company supply a satisfactory service and are willing to erect additional stations where the Postmaster-General may consider them necessary, he will not license any other broadcasting service during the interim period up to December 31st, 1924.

After that date, if the Postmaster-General should consider it desirable that additional stations should be established in any town or district where the Company's service is not adequate, and if the Company are not prepared to provide such stations, the Postmaster-General reserves the right not only to license other organisations to do so, but also to give them an appropriate share of the revenue arising from new receiving licences in the district in question. He also reserves the right to license other services (without regard to geographical area) without withdrawing from the Company any part of the licence fees to which they may be entitled. In either case, he reserves the right to allot suitable wavelengths to the new organisation, while taking all reasonable steps to avoid creating interference with the Company's services.

The Postmaster-General proposes at an early date to appoint an Advisory Board, as recommended by the Committee, to assist him in all important questions relating to broadcasting. He has noted with pleasure the Committee's commendation of the present broadcasting service; and he trusts that the service will give increasing satisfaction under the new conditions, and that a great impetus will be given to the sale of British-made receiving apparatus.

In the enforcement of the new scheme of licensing, much will depend upon the willing co-operation of the public. So long as there has been no licence to fit the case of the many thousands of "listeners" who are using home-made apparatus, it would have been unreasonable for the Post Office to attempt to enforce the law with any strictness; but now that such a licence is available, there will no longer be any excuse for the use of receiving apparatus without a licence. The Postmaster-General believes, however, that the "listening" public will require no pressure in this respect. He is confident that they will be not only willing, but anxious, to put themselves right as regards the law, and at the same time to contribute their quota towards the cost of a service which is affording them so much enjoyment.

Copies of the Broadcasting Committee's Report may be purchased through any bookseller or directly from H.M. Stationery Office

at the following addresses:—Imperial House, Kingsway, London, W.C.2, and 28, Abingdon Street, London, S.W.1.; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; and 120, George Street, Edinburgh. Its price is 9d., or, if ordered by post, 1d. extra for postage.

General Post Office.

October, 1923.

Y The issue of Constructors' Licences necessitated the revision of the terms of application for an Experimenters Receiving Licence, which are now issued in two forms.

(a) On payment of a fee of 10s. a year in cases where the Applicant makes a declaration that the installation will not be used for the reception of broadcast programmes except for experimental purposes.

(b) On payment of a fee of 15s. a year if issued without this restriction.

(The essential difference between the Constructor's licence and the unrestricted Experimenter's licence is that the latter does not stipulate that the component parts of the set must be manufactured in Great Britain or Northern Ireland.)

The form of application is practically unchanged except for the addition of the following alternative Declarations:—

(a) I DECLARE that the proposed installation will not be used for the reception of broadcast programmes, except for experimental purposes.

(b) I DESIRE also to use the proposed installation for the reception of broadcast programmes for the purpose of entertainment, and I agree on that account to pay a licence fee of 15s. (instead of 10s.) per annum.

Signature of Applicant

Date

A Copy of the Summary of Conditions issued by the Postmaster-General is printed below:—

EXPERIMENTS IN WIRELESS TELEGRAPHY.

N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR RECEIVING.

Summary of Conditions of Issue.

(1) The Applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be

furnished if possible; but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals. Any permit granted will be issued in his name and he will be personally responsible for the observance of its terms.

(2) The installation shall be subject to the approval of the Postmaster-General and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office, who will produce their cards of identity on request.

(3) Secrecy of correspondence shall be observed.

(4) Applicants must satisfy the Postmaster-General that they have in view some object of scientific value or general public utility and that they are competent to carry out experiments in wireless reception.

(5) The apparatus shall not be used in such a manner as to cause interference with the working of other stations. In particular, reaction must not be used to such an extent as to energise any neighbouring aerial.

(6) A fee of ten shillings in respect of each experimental station is payable annually in advance so long as the licence remains in force. This fee is increased to fifteen shillings if the licensee desires to use the installation, not only for experimental purposes, but for the reception of broadcast programmes for other than purely experimental purposes.

The period covered by the first payment expires twelve calendar months after the first day of the month of issue.

(7) *Aerials.*—Dimensions allowed are as follows:—Combined height and length not to exceed 100 feet.

(1) *Portable Stations.*—General conditions same as for fixed stations.

Use will ordinarily be authorised only within a radius of 10 miles of a fixed point.

The applicant for authority to use wireless receiving apparatus should complete the form of application forwarded herewith and return it to The Secretary, General Post Office, London, E.C.1, together with the required evidence of British nationality, &c.

The fee should not be forwarded until formal application is made for it.

No. 43.

Revised October, 1923.

GREECE.

(See Maps 3 and 14)

THE Kingdom of Greece comprises the southern part of the Balkan Peninsula, including Western Thrace, Macedonia, Epirus and islands in the Ægean, Mediterranean and Ionian Seas, including Crete.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Rear-Admiral C. Vulgaris Com. R.N.L. Theocharis Com. R.N. Gr. Mezeviris, Radio Engineer	Minister of the Navy Head of the Radiotelegraphic Service . . First Assistant to Head of Radio Service	Ministry of the Navy. 53, Panepistimiou Street 24, Ithakis St., Athens

CONTROL AND ORGANISATION.

The following is a summary of the wireless stations under the control of the Greek Naval Authorities.

Land Stations under the Ministry of the Navy	..	11
Receiving Station under the Ministry of the Navy	..	1
Private Receiving Stations	.. .. .	9
Private Land Station	.. .. .	1
Ship Stations for Public Service	.. .. .	152
Stations on Warships	.. .. .	41
Government Land Stations for Public Service	.. .. .	2

At present only the Vari station (near Athens) and the Corfu station are open for public service. During the present year other coast stations will also be opened.

The main 60 kW. station of Athens has been completed, but it has not yet been opened to the public service. This station is now only used for transmitting meteorological signals and press bulletins and for official communications.

Time and meteorological signals are also transmitted by the old Athens station. The transmission of time and aviation signals is shortly to be placed on new basis.

The conversion of some of the existing coast stations from spark to C.W. is proposed during the present year.

ADMINISTRATION.

A—Law 1831, passed January 14th, 1920.

B—Regulations for the Wireless Service of the Merchant Fleet.

C—Royal Decree concerning the Qualifying Examinations for Operators of Private Wireless Telegraph Stations.

D—Form of Ship Licence.

E—Form of Radio Operator's Licence.

LAW 1831.

A Concerning the organisation of the Radiotelegraphic and Radiotelephonic Service of the State and the formation of a Directorate of Radiotelegraphic Service of the Navy.

Passed, January 14th, 1920.

CHAPTER A.

General Clauses concerning the Radiotelegraphic and Radiotelephonic Service of the State.

ART. 1.—The installation and operation of Radiotelegraphic and Radiotelephonic Stations on Hellenic territory and on board Hellenic ships constitutes a State monopoly.

ART. 2.—The State may grant permission to private individuals to install and operate radio stations on land and on board ships under conditions specified in the licence. Any such licence may be revoked or the conditions under which same has been granted be altered when the station interferes with the working of Government Stations or does not fulfil the conditions under which the licence has been issued.

In time of mobilisation of the naval or military forces the licence for the operation of private stations may be revoked without notice.

The State may take possession of private stations for its own use in mobilisation time after paying compensation as mentioned in the licence.

The State reserves to itself the right to purchase any private station in time of peace and if the licence be revoked in accordance with the first paragraph of the present article

after a certified decision of the permanent advisory board as in Article 8, compensation is fixed by a council of arbitrators composed of three members, one chosen by the competent Ministry, the second by the owner, and the third by the President of the Athens Court of Appeal.

If more than one owner is interested and these do not agree as to the choice of an arbitrator, each of them shall propose one, and the arbitrator shall be chosen from them by ballot in the presence of the arbitrator chosen by the President of the Court of Appeal.

Such a Council settles definitely any dispute regarding compensation due for the temporary seizure of the station.

ART. 3.—Radiotelegraphists operating private wireless stations must be in possession of a licence issued by the State after successful examination, and undertake the obligation to preserve the secrecy of correspondence.

Licences are valid for a term of three years and a stamp of 10 Drs. is affixed to them. When Greek subjects are concerned; the application for the issue of the licence must be accompanied by certificates proving that the applicant is not a deserter from Government Forces and has not been convicted in accordance with Article 22 of the Penal Code.

Licences for Radiotelegraphists issued before the promulgation of this law are not valid after the lapse of one year.

ART. 4.—Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

1. Every person who establishes a radio station or sets any radio apparatus on land or on board ship without a licence.

2. Any person employing an operator not holding a State licence.

3. Any person violating the terms under which the licence of installation of wireless station has been granted.

4. Any person who sends or transmits any fraudulent distress signal or who without lawful excuse interferes with or obstructs any radio communication of other stations as well as persons exhorting operators to transmit such signals.

5. Any person causing damage or destruction to the radio apparatus.

6. Any person violating the regulations in force.

7. Any person violating the due secrecy of the radio communication.

The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excluding any penalty provided by the Penal Code or by the Military Penal Code in the event of a Military case.

The same Court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

In addition to the above penalties the Minister can order, when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

The licence of an operator punished by the Court for one of the above cases is suspended temporarily or permanently on the judgment of the Court. Should the competent Minister think that the infringement effected by the operator is not serious as to demand action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his licence for a period not exceeding three months.

ART. 5.—The land stations of the State are divided into two classes:—

(a) Inland Radio stations for the transmission of official or private correspondence with ship stations or other Inland or Coast Stations of the State or Stations abroad providing that there are no private Wireless Stations.

(b) Shore or Coast Radio stations for the transmission of official or private correspondence to ships or other coast and land stations in the State or abroad, providing that there are no private stations for wireless correspondence.

The Government stations on board ships are divided into two classes:—

(a) Stations on board warships.

(b) Stations having been specially installed by the State on board merchant ships, exempted by the present law for the ships' particular use.

ART. 6.—All wireless telegraphic subjects come under the special jurisdiction of the Ministries of Marine, of Communications, and of National Economy, who are kept *au courant* with wireless telegraphic questions in connection with merchant shipping by their representative and member to the Advisory Board (provided for by Article 8), the Director of the Merchant Shipping Department, or by direct communication of the Marine Minister providing special arrangements are made.

The following come under the special jurisdiction of the Minister of Communications:—

(a) The installation and operation of the land stations.

(b) The issue of licences for the installation and operation of private land stations, the inspection and supervision of their operation, the observance of the regulations in force and the conditions stipulated in the licence of these stations upon decision of the board provided for in Article 8.

(c) The control and payment of accounts for private radiograms transmitted by stations under his jurisdiction, or that of the Minister of Marine who in turn transmits full information concerning the subject.

For this purpose the staff of the office of the Ministry of Communications shall be fixed by special Royal Decree.

The following come under the jurisdiction of the Ministry of the Navy:—

(a) The installation and operation of the coast stations, of warship stations, and stations of the State on merchant vessels.

(b) The issue of licences for the installation and operation of private stations on merchant vessels and private coast stations after consultation with the Advisory Board, the inspection and supervision of their operation, the observance of the regulations and conventions in force and conditions stipulated in the licence of the station.

(c) The issue of licences to the operator of all stations.

(d) The control of ships or land stations and the observance of rules and conventions shall be fixed by Royal Decree and special regulations.

(e) As coast or shore stations are considered all stations installed a small distance from the coast if they keep up Naval radio-communication.

ART. 7.—Temporarily and until the formation of a Technical Service has been effected at the Ministry of Communications all matters under its jurisdiction except those stipulated in Chapter C will pertain to the Ministry of Marine.

A permanent Advisory Board is established at the Ministry of the Navy, composed of the Head of the General Staff of the Navy as Chairman, the Director of Posts and Telegraphs, the Director of the Radio-Service of the Navy, the Head of the Radio Department of the Ministry of Communications, and one officer of the Army General Staff appointed by the Chief of the Staff, and of the Director of the Merchant Shipping Department in the Ministry of National Economy.

This Board considers:—

(a) The necessity for the erection of land stations.

(b) The issue of licences for the installations of private stations in the interior or on the coast and the cancellation of such licences.

(c) Matters pertaining to International Conventions.

(d) Questions arising between different services.

(e) Any relative matter brought forward by the Ministers of the Navy and Communications or of the Ministry of National Economy.

ART. 9.—The coast station charges and ship charges are fixed by Royal Decree according to circumstances after the consultation with the Advisory Board.

CHAPTER B.

CONCERNING THE RADIO-SERVICE ON BOARD MERCHANT SHIPS.

ART. 10.—All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation:—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by $34^{\circ} 0'$ to $42^{\circ} 20'$ north latitude and the meridians $17^{\circ} 0'$ to $30^{\circ} 0'$ east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram, may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article, there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons.

ART. 11.—The power of the wireless sets provided for in the foregoing article will be defined in the licence and shall be able to transmit signals clearly under normal circumstances at a distance of at least 100 nautical miles, in addition they shall be equipped with an emergency gear which elements shall be under the greatest safety conditions.

ART. 12.—The clearance of ships, subject according to Article 10 to carry a wireless set, and not being fitted therewith, is prohibited by the harbour authorities. The acceptance of Greek passengers on ships of foreign nationality which are not equipped with wireless is also prohibited for voyages where Greek ships are required to be equipped.

ART. 13.—Merchant ships exempted from the obligation to be fitted with a wireless set may be fitted with State apparatus for purposes of the War-Navy. All expenses of installation and maintenance of the necessary staff for the operation being reserved to the competent Ministry.

ART. 14.—All ship radio-charges are deducted from the general radio-charges and belong to the shipowner or to any person having the exploitation of the radio-station under special arrangement with the shipowner.

In cases where the ship helps in salvage or affords assistance to another ship in consequence of a radiogram the shipowner is required to pay to the State 10% of the net sum which he obtains for salvage, but only if the apparatus belongs to the State, this sum being devoted to the *Naval Caisse des Invalides*.

CHAPTER C.

CONCERNING THE RADIO-SERVICE OF THE NAVY.

ART. 15.—A Direction of Radio-Service of the Navy is formed in the Ministry of the Navy under the immediate orders of the Minister of Marine and to which, in addition to matters specified in Article 6 of this law, are subject: The enlistment, training, appointment and alterations of the staff serving on stations subject to the jurisdiction of the Ministry of the Navy or any other relative matter to be fixed by Royal Decree.

(Further articles concern the special service of the Naval Radio-Corps.)

REGULATION OF WIRELESS SERVICE ON MERCHANT SHIPS.

CHAPTER I.

SHIPS BOUND TO BE FITTED WITH RADIO-TELEGRAPH INSTALLATION.

1. All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage, if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation:—

(a) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(b) Passenger ships whose voyages are included in the parallelogram limited by $34^{\circ} 0'$ to $42^{\circ} 20'$ north latitude, and the meridians $17^{\circ} 0'$ to $30^{\circ} 0'$ east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons.

2. The power of the wireless station on merchant ships is fixed by the Direction of the Radiotelegraphic Service of the Navy (D.R.S.N.), and is prescribed in the licence according to the voyages undertaken by the various ships. As a minimum limit should be taken the clear transmission of signals to a distance of at least 100 naval miles under normal conditions. In addition merchant ships must be fitted with an emergency set, the whole system of which must be kept in the safest condition. The accumulators must be placed out of the wireless cabin and if possible in the open air in dry cases. The wireless cabin must be connected with the bridge by some safe means assuring verbal communication.

3. Each shipowner, obliged by this law to install a radiotelegraph station on his ship, must submit an application to the D.R.S.N. (Inspection Department) for the necessary licence.

In the application the following items of the ship must be prescribed:—

- (1) Dynamo—how moved and where placed.
- (2) Masts—distance between and height.
- (3) Capacity (deadweight).
- (4) Passenger or cargo.
- (5) Number of crew.
- (6) Voyages undertaken.
- (7) System of the radiotelegraphic station to be installed.
- (8) Length of aerial.
- (9) Wave system.
- (10) Wavelengths used.
- (11) Emergency set.

After the installation the shipowner submits to the D.R.S.N.:—

- (1) Small drawing of the aerial.
- (2) Small drawing of the connections.
- (3) Disposition of the set in the cabin.

The responsibility for the accuracy of these certificates is borne wholly by the shipowner.

The D.R.S.N. on granting the necessary licence can accept the above items or change them, the shipowner being obliged to comply with the suggestion of the D.R.S.N.

4. Shipowners not bound by law and wishing to install a radio set on their ships must apply by a similar application as above.

5. The D.R.S.N. on granting a licence assigns the call letters to the station.

6. Merchant ships are divided into three classes, A, B, C, as regards the wireless installation :—

Class A.—To this class belong all the passenger ships travelling at a distance of more than 200 miles from the coasts. The ships of this class must be in permanent watch.

Class B.—To this class belong all other ships which are bound by law to be fitted with a radiotelegraphic installation; the ships of this class are bound to keep limited watch during the voyage which is regulated in accordance with the needs of the voyage. In any case the station of these ships must be in watch the first ten minutes of each hour.

Class C.—To this class belong all ships fitted with wireless installation without being bound by law. The station of these ships have no fixed watches.

CHAPTER II.

SERVICE OF WIRELESS STATION ON MERCHANT SHIPS.

9. The wireless stations service of Greek merchant ships must be carried out by telegraphists holding a Greek licence granted in accordance with Law 1831 by the D.R.S.N.

10. The stations of ships of class A are served by two operators at least, one of whom must hold a first-class licence.

11. The stations of ships of class B are served by at least one operator holding a first-class licence.

In cases where no second operator is carried a member of the crew must be able to understand the distress signal or the call of another station, so that he may at once inform the telegraphist.

The skill of the said member of the crew shall be tested and mentioned in the respective report of the Wireless Inspector.

12. The station of a ship of the C class must be served by at least one operator holding a second-class licence.

13. The operator of the ship in charge of the station is responsible for the regular carrying out of the service, the keeping up of books, the cleaning and maintenance in good order of the apparatus. The other operator must obey him.

14. Each merchant ship station must be supplied with the following papers :—

(1) The licence for the installation.

(2) A copy of the present Wireless Regulation and of any other subsequent or of any circular concerning the radiotelegraphic service.

(3) A copy of the International Wireless Convention and of annexed regulation.

(4) The official list of wireless stations and alphabetical list of call letters.

(5) Radiogram prints.

(6) A copy of the standing wireless and cable rates and the protocol of the wireless station.

(7) A log-book for the wireless station.

The operator will state from time to time on a slate placed out of the wireless cabin the coast station with which he is in touch.

15. The operator on service shall keep in a log-book of the station a record of all orders received and all other observations connected with the wireless service and any infringement of the regulations.

The log-book of the station will be considered as an official document and it is forbidden

to detach leaves therefrom or to use erasers on its pages. It may thus serve as means of proof before the courts and the competent authorities.

16. The wireless station on a merchant ship and the operators serving it are under the direct orders of the captain who regulates their watch on his own responsibility. But the operator is responsible for any signal or call of the station or any message which he receives and has not passed in the protocol of the station.

17. The captains of the merchant ships must take the necessary steps to secure during the voyage the necessary electric power for the transmitting set for the regular service of the station.

18. When the captain, on his own responsibility, forbids communication or orders silence to a station's call, or in general gives orders to the operator contrary to the regulations or hinders the operator in the fulfilment of his duties in any way, the latter must call the captain's attention to the fact, and if the captain insists, the operator must obey stating the fact in his log-book, and as soon as the ship arrives at a Greek port he must report the case to the wireless inspector or in the latter's absence to the harbour master.

19. The correspondence and the service in general of merchant ships is carried out in accordance with the regulations annexed to the International Radiotelegraphic Convention of London and with the present regulations, as well as with any other order of the D.R.S.N.

Operators are also bound to carry out all orders and to comply with the instructions given by the wireless inspector.

20. On no account may a ship station use other call letters than those prescribed in the licence.

21. The transmission of radiotelegrams in harbours or bays in the proximity of coast stations is prohibited.

22. Merchant ship stations are bound to suspend transmission as soon as a coast station requires it. As a general rule the ship stations must comply with the orders given by the coast stations.

23. In time of mobilisation or Naval manœuvres the ship stations must conform to the instructions given by the Greek Navy.

24. Before leaving port the operator in charge of the station must try the working condition of the main and emergency set. This test, however, is carried out by disconnecting the aerial. Whenever the operator thinks it necessary to verify the radiation of the station and its emergency set or the sensitivity of the receiver he applies for it, using the international abbreviation.

25. The operators in charge of merchant ships are bound, when they proceed to a Greek harbour, to report at once to the wireless inspector or to the harbour officer all deficiencies of the station and in his personnel.

26. The captain is bound at specified intervals not exceeding four hours to give the operators the position of the ship which is to be constantly suspended under their view in the receiving cabin.

27. The operator receiving (by any means) knowledge of a message dangerous to the interests of the country must report it at once to the captain and to the nearest Government coast station or warship or harbour authorities, and simultaneously must draw up a report embodying the message, the station in communication, and full information on it, which he forwards to the D.R.S.N.

28. If the wireless operator receives a suspicious message for transmission from a passenger, before transmitting it he must ask the permission of the captain.

29. It is forbidden for operators to undertake service at a station not fitted with a regular licence.

30. All operators must carry their licence in the ship to which they belong.

31. It is forbidden for operators to maintain communication by wireless on subjects not referring to the wireless service.

32. Whenever the operator hears any infringement of the rules effected by other stations he must report at once the fact with all necessary particulars to the D.R.S.N., and he will record in his log-book exactly what he has heard.

33. It is absolutely forbidden for a third station to interrupt two stations already communicating.

34. As a general rule wireless operators must constantly recognise that it is of their duty to enable the wireless communication to be carried out regularly and not to be absorbed exclusively by the finishing up of their service in the station they belong to.

35. It is forbidden to every person not concerned in the service of the station to enter the wireless cabin.

36. Captains are bound to supply the necessary personnel for the cleaning of the station and the repair of the aerial and of the set and generally to grant all assistance for the maintenance and regular service of the station.

37. Merchant ships' operators hold officer's rank of the merchant fleet.

38. Operators on finally landing from a merchant ship must present their licence to the captain before landing, who endorses on it the capacity and character of the operator as shown during his service period.

CHAPTER III.

PENALTIES FOR THE VIOLATION OF THE LAW AND THE REGULATION.

39. Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

(1) Everyone who establishes a wireless station or sets any radiotelegraphic apparatus on land or ship without a licence.

(2) Any person employing an operator not holding a State licence.

(3) Any person violating the terms under which the licence of installation for wireless has been granted.

(4) Any person violating the regulations in force.

(5) Any person who sends or transmits any false or fraudulent distress signals or who without lawful excuse interferes with or obstructs any radio communication of the station.

(6) Any person causing damage or destruction to the radiotelegraph apparatus.

(7) Any person violating the due secrecy of the radio communication.

(8) Any person violating generally any regulation of the rules in force.

40. The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excepting any penalty provided by the penal code or by the military penal code in the event of military case.

41. The same court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

42. In addition to the above penalties the Minister can order, when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

43. The licence of an operator punished by the court for one of the above cases is suspended temporarily or permanently on the judgment of the court. Should the competent Minister think that the infringement effected by an operator is not so serious as to demand such action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his licence for a period not exceeding three months.

CHAPTER IV.

INSPECTION OF THE WIRELESS STATIONS OF MERCHANT SHIPS.

44. In harbours specified by order of the Minister of Marines there are centres for inspection of wireless in active service.

45. In these centres there are Inspectors of the corps of the wireless operators of the War-Navy to superintend the application of Law 1831 of the International Convention and the Regulations for Wireless Telegraphy which are in force.

46. The Inspectors communicate directly with the harbour officers and co-operate with them in order to enforce the law.

47. The Wireless Inspectors, or failing them, the harbour officers, inspect the ships affected by the law before their departure and verify whether they are fitted with wireless as well as with the necessary personnel and the class of operators in accordance with the law and the present regulations.

48. The Wireless Inspector who discovers an infringement of the law or the regulations reports it simultaneously to the harbour master who either prevents the leaving of the ship in accordance with law or reports the infringement effected to the D.R.S.N., asking for the suspension of the responsible operator or the imposition of a penalty according to the nature of the infringement effected.

The Harbour Master accompanies such report with a detailed report concerning the transgression committed, signed by him and the Wireless Inspector, and if need be accompanied by a sworn statement to this effect, which he may obtain from any person acquainted with the fact. He also submits any other item which might be useful to the court.

49. If the inspection of the ship station is impossible the Inspector or the Harbour Officer can ask for a written statement from the captain testifying that the station is maintained in good condition.

50. The Wireless Inspector can accept as a proof of the efficiency of the set and the capacity of the operators of the ship under examination, radiograms transmitted or received during the lapse of the last voyage to the harbour where they are from a distance of at least 100 miles.

51. For any obstruction or difficulty caused by the captain or other person of the ship with regard to the service and the duties of the Inspectors or the Harbour Officers the captain of the ship will be held responsible and against whom the Harbour Master may at once order legal proceedings to be taken.

52. The captain is responsible if he sail from any harbour where there is an Inspector without having his wireless installation in order or the requisite number of operators.

53. All consequences of the law concerning the infringement of the regulations will be enforced against the captain or the shipowner or against both according to the circumstances.

C ROYAL DECREE CONCERNING THE
QUALIFYING EXAMINATION FOR
OPERATORS OF PRIVATE WIRELESS
TELEGRAPH STATIONS.

ART. 1.—Any person desirous of taking out a licence for wireless telegraphy (class A or B), or of renewing the one he already possesses, must forward, on or before the 25th of the month preceding the date of the examination, the following particulars to the Wireless Telegraphy Department of the Navy:—

(1) An application on a form bearing a stamp to the value of 50 leptas, and, in addition, a stamp of 60 leptas, for the licence he wishes to obtain. In this application must be recorded the system, selected from those in use on board of Greek ships, on which the candidate wishes to be examined.

(2) If the candidate is a Greek citizen, a certificate from the Mayor or President of his Community, relating to the record of the candidate in the register of males. For foreigners a certificate from their respective Consular authorities is required.

(3) Certificates from the Prosecutor of the First-Instance Court and Court of Appeal to the effect that he has not been sentenced to any penalty provided by Art. 23 and 24 of the Penal Code.

(4) Certificate from the Recruiting Department, if the candidate is a Greek subject, to the effect that he has accomplished his military duties, or is not yet liable for military service.

(5) A quittance of payment to the Paymaster of the Wireless Telegraphy Department of the Navy, to the value of 50 drachmas, representing the examination fees, and serving as a recompense to the examining committee. These examination fees are reduced to one-half for those serving in the Navy or in the Army for the whole period of service, or in the event of their passing the examination within three months after their discharge from the ranks.

(6) Candidates for a first-class licence must forward a certificate from the captain of a ship or the chief of a land station to the effect that they have actively served in a wireless station, public or private, during six months at least.

ART. 2.—The examination takes place in the Main Wireless Station of Athens, during the

first ten days of the months of January, April, July and October.

ART. 3.—Persons desirous of obtaining a licence in classes A or B, or of renewing that already in their possession, must pass the following examinations:

Syllabus of examination comprises:—

- (a) *Written examination in general knowledge of electricity.*
- (b) *Practical examination in manipulation.*
- (c) *Practical examination in receiving.*
- (d) *Oral examination in use of apparatus, detection of faults, etc.*
- (e) *Written examination in rules and regulations.*

ART. 4.—To successfully pass the B class licence examination the candidate must get at least 60 per cent. of the highest possible marks in the (a) examination, and 70 per cent. in each of (b) (c) (d) and (e).

To successfully pass a first class licence examination, the candidate must obtain at least 70 per cent. of the highest possible marks in the (a) examination, and 75 per cent. at least in each of (b) (c) (d) and (e).

ART. 5.—The Examining Commission is composed of three members chosen from the officers or civil engineers of the Naval Wireless Service Department, and nominated by order of the Director.

When the examination is finished the President of the Commission submits the results to the Director of the Naval Wireless Service, who grants the licence.

FORM OF SHIP LICENCE.
KINGDOM OF GREECE.

No.....

DIRECTION OF THE NAVAL RADIOTELEGRAPH
SERVICE.

D In accordance with Law 1831, with the London Wireless Convention of 1912, and with the Regulations on the Wireless Service of the Merchant Fleet, we grant the licence for the erection and operation of wireless station on-board s.s. of tons deadweight, registered at Belonging to

The technical particulars of the station are as follows:—

Station Class Call letters
Power System
Aerial length Wavelength
Receiver
Emergency set
Electric power
Staff

Back Part.

Locality and date of birth.....

Remarks

Signature.....

PHOTO

SERVICE CONTROL.

Station Name.	Service Time.	Remarks.	Signature of person in charge or of the Captain.

The operation of the station is subject to the provisions of the above laws, conventions and regulations, as well as to the provisions of all regulations issued by the Direction of the Naval Radiotelegraph Service.

The present licence is valid as long as the London Convention of 1912 is in power, and is revocable for any case referred to in Law 1831.

Athens, the.....19..

The Director of the Naval Radiotelegraph Service.

KINGDOM OF GREECE.

No.....

DIRECTION OF THE NAVAL RADIOTELEGRAPH SERVICE.

OPERATOR'S LICENCE.

E CLASS.

Mr..... has been examined successfully on the following matters:—

- (a) Operation and regulation of apparatus.
- (b) Transmission and reading of signals at a speed of at least..... words per minute.
- (c) Knowledge of the regulations on the wireless communication.

The above-mentioned has undertaken the obligation of maintaining the secrecy of Radio communications, and therefore the present licence is granted, owing to which he may undertake Wireless service in Greek merchant vessels as well as at land stations.

The present licence is valid for a term of three years beginning to-day and as long as the London Convention of 1912 is in force.

The present licence is temporarily or definitely revocable for any obstruction, according to Article 4 of Law 1831, of which he has knowledge.

Athens the.....19..

The Director of the Naval Radiotelegraph Service.

HOLLAND (Netherlands).

(See Map 11).

THE Kingdom of Holland is a constitutional monarchy, the executive being vested in the King or Queen (acting through the Ministers), and the power to make laws in the King or Queen with Parliament ("Staten Generaal"). The Parliament consists of two chambers, of which the second is directly elected by the people and the first by the "Provinciale Staten."

CONTROL.

Except in so far as the Navy, the Army, and the Colonies are concerned, wireless telegraphy is placed in the hands of the Director-General of Posts and Telegraphs under the supervision of the Minister of Waterways.

Stations on ships at sea may not be established or worked by private enterprise without a licence issued by the Queen. The general conditions which are imposed are laid down in the form given below.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Minister G. J. Van Swaay ..	Minister of Waterways ..	Zyne Excellentie den Minister van Waterstaat te 's Gravenhage
Mr. A. A. H. W. König ..	Director-General of Posts and Telegraphs	Den Heer Directeur Generaal der Posteryen en Telegrafie te 's Gravenhage
Mr. A. E. R. Collette ..	Chief Engineer, Director of Telegraphs	Den Heer Hoofdingenieur Directeur der Telegrafie te 's Gravenhage
Mr. J. A. Blandvan den Berg	Inspector of Coast and Ship Radiotelegraph Service	Den Heer Inspecteur bij den dienst der Kust-en Scheepsradiotelegrafie te 's Gravenhage

ADMINISTRATION.

The regulation of radiotelegraphy was first instituted by including a clause relating to wireless in the Telegraph and Telephone Act of 1904. This Act has been supplemented and amended, as far as radiotelegraphy and telephony are concerned.

In 1919 Parliament passed the Bill (presented by the Minister of Agriculture, Industries and Commerce in 1916) to give effect to the International Convention for the safety of Life at Sea. This Act (Shipping Convention Act of April 5th, 1919) is in agreement with the Articles of the Convention, but has not yet come into force.

The Netherlands possesses important colonies in the East Indies, as well as in South America, and the wireless laws and regulations current in those colonies are appended in the following pages.

The text (so far as radiotelegraphy is concerned) of the following enactments figure below :—

- A—Telegraph and Telephone Act of 1904 (supplemented and amended 1919).
- B—Royal Decree, 6th March, 1905 (modified 1914 to 1921). Modifying Act of 1904.
- C—Royal Decree, 22nd November, 1921, concerning transmission of messages.
- D—Royal Decree, 11th December, 1922, concerning messages from ships.
- E—Prescription issued by Minister of Waterways.
- F—Licence for Ship Station.
- G—Licence for Experimental Station.
- H—Royal Decree, 9th July, 1921, concerning use of Receiving Apparatus.
- I—Article of Penal Code, concerning Violation of Secrecy.

COLONY OF CURAÇAO.

- J—Public Notice No. 52, of 1909, concerning Telegraphic Communication.
- K—Public Notice, No. 25 of 1923, modifying Penal Code.

DUTCH EAST INDIES.

- L—Regulation for Telegraph Service.

TELEGRAPH AND TELEPHONE ACT OF 1904.

A The Telegraph and Telephone Act of 1904 mainly refers to the ordinary wired services, and it has not been judged worth while, therefore, to reprint it in full here.

According to Article II of this Act, a licence granted by the Queen is necessary before telegraphs and telephones can be established or worked by private enterprise. The Act also contains the terms under which the licence is issued and the conditions binding on the licensee.

The above provision is also applicable to wireless telegraphy.

Article III prescribes that for the establishment and the use of radiotelegraph and telephone stations not destined for general public service an authorisation from the Minister of Waterways is required.*

ART. IIIA.—It is forbidden to work radiotelegraphs and telephones, be they destined for public service or not, on board vessels other than of Dutch nationality when within territorial waters, or in waters within the territory of the kingdom, unless it be done in accordance with the prescriptions fixed by the Minister of Waterways (*see "B"*).

For the radiotelegraphs and telephones referred to in the first part of this Article neither licence nor authorisation is required unless they are within the territorial waters of the kingdom and without the licence required in virtue of the International Telegraph Convention (with Regulations) of London such as it is at present constituted (*Staatsblad* 1913, No. 132) or may be constituted, also as it may be modified for the Netherlands.

* **NOTE.**—Stations only suitable for the reception of radiotelegraphic signals are not considered as radiotelegraph and telephone stations.

B Royal Decree of the 6th March 1905 (State Paper No. 90), for the institution of a general measure of Government, as contemplated in Art. 12 of the Telegraph and Telephone Code, 1904 (State Paper No. 7), in so far as this Decree reads after the modifications introduced into it by the Royal Decree of the 11th July, 1914 (State Paper No. 302) of the 15th November, 1919 (State Paper No. 753), and of the 9th July, 1921 (State Paper No. 903).

ART. 1.—Unless provided with a licence from our Minister of Waterways and with due regard to the terms and stipulations set forth therein for the prevention of the interruption of the working of telegraphs and telephones intended for the service of the public, it is forbidden to erect or to use :—

1. (a) Any overhead electrical conductor for purposes of lighting or the transmission of motive power situated within less than 6 metres in horizontal distance from any overhead conductor belonging to the Telegraphs and Telephones intended for the service of the public;

(b) Any other overhead electrical conductor situated within less than 2 metres in horizontal distance from any overhead conductor belonging to Telegraphs and Telephone intended for the service of the public;

2. Any underground electrical conductor situated at less than 0.50 metres distance from any underground conductor belonging to Telegraphs and Telephones intended for the service of the public; electrical conductors inside buildings are not comprised among the conductors mentioned in 1 and 2.

The licence referred to under paragraphs 1 and 2 is not required for electrical conductors and installations which were already in use when the general measure of Government came into force.

ART. 2.—It is forbidden to put any obstacles in the way of the working of telegraphs and telephones intended for the service of the public by means of any electrical conductor or installation.

ART. 2A.—Notwithstanding the stipulation contained in the preceding article, the possession and use of plant, which is merely suitable for the reception of wireless telegraphic and telephonic signals, are only permitted with due observance of the prescriptions which are laid down by our Minister of Waterways.

ART. 3.—The costs incurred in the carrying out of arrangements for the purpose of removing obstacles which have been placed in the way of the effective working of telegraphs and telephones intended for the use of the public by an electrical conductor of plant already in existence at the time of the installation of such telegraphs and telephones shall be borne by those who undertake the installation of the said telegraphs and telephones to such an extent as these costs may be approved by our Minister of Waterways.

ART. 3A.—The preceding articles of the Decree are equally applicable to telegraphs and telephones which are installed by the State but which are not intended for the service of the public.

ART. 4.—The carrying out of the prescriptions of this general measure of Government is entrusted to the police officers and officials of the State and the municipalities, the inspector in the coastal and ship wireless telegraph service, the chief engineers and engineers, the electro-technical chief officers and officers of the telegraphic service. The official reports drawn up by them are transmitted to the competent officer of the Public Ministry at the District Court, a copy of such reports being also sent to the Director-General of Posts and Telegraphs.

ART. 5.—Violation of the prescriptions set forth in Articles 1, 2 and 2 bis of this general Government measure is punished, and this in so far as it may otherwise be provided for by the law, by imprisonment for a period not exceeding 30 days or by a fine not exceeding 300 florins.

ROYAL DECREE OF NOVEMBER 22ND, 1921,
RELATING TO TRANSMISSION OF MESSAGES
MARKED "BY WIRE."

Royal Decree of the 22nd November, 1921 (State Paper No. 1344).

C ART. 1.—Unless telegrams are provided with the gratuitous direction "By Wire," the Telegraph Administration are entitled to make use either of the wireless telegraphic service or of the line telegraphic service for their transmission.

A decision will be made by or on behalf of our said Minister and published in the official *Gazette* with respect to which telegrams use shall be made of the right indicated in the first paragraph.

This right is made use of with respect to telegrams handed in in Holland and destined for the United Kingdom and Germany, or for points beyond these countries and for the Dutch East-Indies.

ROYAL DECREE OF 11TH DECEMBER, 1922
(OFFICIAL GAZETTE No. 668), FIXING THE
RATES FOR TELEGRAPHIC COMMUNICATION IN
CONNECTION WITH MESSAGES AND SIGNALS OF
DISTRESS RECEIVED BY MEANS OF RADIO
TELEGRAPHY FROM SHIPS AT SEA.

D ART. 1.—The Government radio-telegraphic service at Scheveningen Harbour gives information of messages obtained from ships by means of radiotelegraphy, and signals of distress received, by telegraph, to those who have applied for the same.

ART. 2.—The information referred to in Art. 1 is supplied on payment by the addressee of F.2.50 for each message, which is inclusive of the rate for ordinary or urgent local telegrams, or, as the case may be, for inland or foreign telegrams.

ART. 3.—This decree comes into force on the 1st January, 1923.

PRESCRIPTION ISSUED BY THE
MINISTER OF WATERWAYS.

E Regulations which are prescribed by the Minister of Waterways and which in as far as they do not differ from any international agreement, to which the Netherlands are, or will be bound, are valid for foreign radiotelegraphic or telephonic ship stations which are within territorial waters or in waters within the territory of the Kingdom.

ART. 1.—(1). It is forbidden to use radiotelegraphs or telephones be they destined for public service or not, installed on board of foreign ships within Dutch territorial waters or waters within the territory of the Kingdom, unless the prescriptions of this disposition are observed.

(2). Moreover shall, as far as waters within the territorial limits of the Kingdom are concerned, those stations only may be worked by consent of the Director-General of Posts and Telegraphs when due regard is given to the conditions prescribed in said permit.

(3). Contravention of the rules as set forth in parts 1 and 2 of this article is allowed under special conditions, the requirements of good seamanship should make this necessary.

ART. 2.—(1). Foreign ship stations may exchange telegrams or have a conversation with radiotelegraph or telephone stations destined for public service under reserve of the special rules, which might be valid for any one of these stations.

(2). The exchange of traffic with stations not destined for public service is permitted under reserve of the special rules which might be valid for any one of these stations, and in so far as in the opinion of one or more public stations, the general public radio telegraphic or telephonic service is not interfered with.

(3). All traffic of foreign ship stations is immediately to be suspended, as soon as such is requested by any Dutch coast station open for general public service.

ART. 3.—(1). It is forbidden that by means of foreign ship stations hindrance should be given to the exploitation or the use of Government radiotelegraphs and telephones be they destined for public service or not, or to the exploitation of other radiotelegraphs and telephones destined for public service.

(2). Foreign ships must cease working of their stations as soon as they observe or when they are informed, that their working gives rise to an interference as described in part 1 of this article.

ART. 4.—(1). The Minister of Waterways may suspend the working of foreign ship stations either completely or partly as soon as it is judged necessary.

(2). The Director-General of Posts and Telegraphs has equal competency as far as it concerns suspension at certain places or daily during certain hours.

The licensees of foreign ship stations are subject to and henceforth obliged to adhere to all regulations referring to radiotelegraphy or telephony which are prescribed by the International Radiotelegraph Convention with

final protocol and regulations of London such as it is at present (*Staatsblad* 1913, No. 132), of, later on, also for Holland, might be modified, either are or shall be prescribed by any other International agreement to which Holland accedes or will accede.

LICENCE FOR SHIP STATIONS.

F ART. 1.—In this licence is meant—
By Convention: the Radiotelegraphic Convention with final protocol, signed in London on July 5th, 1912, and all alterations and additions, that may be made thereto.

By Regulations: the Regulations belonging to this Convention with all alterations and additions that may be made thereto.

ART. 2.—The licence is given for an indefinite period, and may be withdrawn at any time, after one year's notice.

The licence, or an authentic copy of it, should always be kept on the ship. It must be shown on request abroad if asked for by the persons authorised herein.

ART. 3.—*System*.—The licensee is obliged to choose a system capable of communication with the Government stations opened for public radiograms, and to make the installation comply with the International Laws and Regulations. The antenna input should be such as to enable a decrease down to 10 per cent. of the maximum input. If an emergency set is required, as set forth in Art. XI of the International Regulations, the source of power, and eventually the other parts of the installation, must be fitted on or above the upper deck, and, furthermore, are subject to the rules to be made therefor by the Director-General of Posts and Telegraphs. In case the position of the wireless cabin does not give the telegraphist direct communication with the bridge, without leaving the operating room, direct communication must be established as may be required by the Director-General of Posts and Telegraphs.

ART. 4.

Hours of Service.

A. *First Class*.—On ship stations belonging to the first class, as stipulated in Art. 13, s. 3, of the Regulations, a continuous service is maintained. Except in cases of *force majeure* these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

B. *Second Class*.—On ship stations belonging to the second class, as stipulated in Art. 13, sec. 3, of the Regulations, the service is maintained during the hours indicated in the official list of radiotelegraphic stations. The hours of service are fixed in consultation with the Director-General of Posts and Telegraphs. Except in cases of *force majeure*, these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

C. *Third Class*.—Here the article only stipulates that the ship station belongs to the third class as indicated in Art. 13, sec. 3, of the Regulations.

ART. 5.

Information.

As for the station on shipboard the licensee is obliged to provide the Director-General of Posts and Telegraphs with all facilities and information necessary for the fulfilment of all legal requirements.

ART. 6.

Approval of the Ship's Station and of the Personnel.

The ship's station will not be put in operation until the Director-General of Posts and Telegraphs has approved the installation of the ship's station, together with the constitution of capacity of the service staff.

A written certificate of the approval of the installation provided by the Director-General before mentioned must be hung in a position where it can be seen, whether near to or inside the ship's station. Such approval is also required in respect of any alterations which it may be necessary to make.

A sum of 25 florins is charged for the provision of the first certificate of approval.

Officers to be appointed by the Director-General aforesaid shall have the right of access at all times to the station for the purpose of making an inspection and ascertaining whether it still satisfies the stipulated requirements.

A note will be made on the certificate referred to of the time at which the inspectors shall have taken place.

In proof that the capacity of the service staff satisfies the stipulated requirements, a certificate is granted by the said Director-General in which are set forth the class and the name, and this certificate likewise contains the assurance that the person in whose name it is drawn up, has given an undertaking to the said Director-General that he will observe secrecy in regard to all the telegrams which may come to his knowledge through the medium of the ship's station.

The certificate may be cancelled if the said Director-General is of the opinion that the person in whose name it has been made out is no longer complying with the stipulated requirements and is, in fact, acting contrary to the terms of the concession.

Information must be given immediately to the said Director-General of any alteration which may have been made in the plant of the ship's station, which affects any term of the convention or of the regulations or of any change which may have been made in the service staff.

ART. 7.

Authorisation to work Station.

The licensee is authorised to exchange telegrams with stations opened to public correspondence, as well as with stations not destined for public wireless traffic, as far as this does not interfere with public correspondence; both authorisations hold good, subject to their not infringing any private rules which might be in force at any of these stations. All communication by a ship station must cease immediately upon the request of a Dutch coast station open to public correspondence.

ART. 8.

Wavelength.

In addition to the wavelength of 600 and 300 metres provided for in Art. 3 of these Regulations, other wavelengths less than 600 metres are used in some cases according to the provisions made by the Director-General of Posts and Telegraphs.

ART. 9.

Places where Transmission is Prohibited.

Apart from the conditions of the Regulations appertaining thereto, it is hereby forbidden without the consent of the Director-General of Posts and Telegraphs, given with due regard to the relevant conditions, to use the ship stations within Dutch territorial waters or any Dutch waters inside those limits, unless under special conditions the requirements of good seamanship make contravention of this rule a necessity.

ART. 10.

Cessation of Traffic.

The working of a ship station is suspended either completely or partly as soon as it is judged necessary to the general interest. Upon the order of the Director-General of Posts and Telegraphs, the service may be suspended at certain places or daily during certain hours.

ART. 11.

Approval according to Art. 2 of the Telegraph and Telephone Act.

The remaining conditions concerning the use, Service Regulations, and the rate of wages and hours of duty of the operators, are submitted for the approval of the Minister of Waterways.

ART. 12.

Exchange of Telegrams.

The conditions of the Dutch Telegraph and International Regulations, and further, the conditions concerning the public Dutch radiotelegraph service, as well as all modifications and supplements thereto, refer to the exchange of telegrams.

ART. 13.

Ship Tax.

The ship tax amounts to

ART. 14.

Accountancy.

The settlement of taxes takes place according to the rules to be fixed by the Director-General of Posts and Telegraphs.

ART. 15.

Secrecy of Correspondence.

The licensee is obliged to observe secrecy in regard to all telegrams which might come to his knowledge by means of the ship station. He must make sure that no person other than the operator in charge of the station has any opportunity of learning the contents of said telegrams.

ART. 16.

Forwarding of Documents.

The forwarding of documents concerning the radiotelegraphic service must take place under the rules of the Director-General of Posts and Telegraphs made according to the restrictions mentioned in Art. XI of the Regulations.

ART. 17.

Obligation to erect, maintain and work to the satisfaction of the Ministry of Waterways.

In conformity with the declaration contained in Art. 26 of these stipulations, the concessionary binds himself to work the ship's station within a period of time to be fixed by the Director-General of Posts and Telegraphs on the occasion of his signifying his approval in terms of Art. 6. The erection, the maintenance, and working of the station must be carried out to the satisfaction of our Minister of Waterways.

ART. 18.

Control.

Officers appointed by the Director-General of Posts and Telegraphs are authorised to control the working of the station and its operators, and to supervise the station service generally. If required they may also take temporary control of the station, upon showing a written and signed authorisation.

ART. 19.

Distress Signals.

For sending or receiving distress signals it is allowed to depart from the conditions of this concession, provided this deviation is necessary for the benefit of the ship in distress. For the distress signal (which may also be given in cases of other accidents than those which may occur to the ship concerned) no other signal may be used except the signal • • • — — — • • • unless approved by the Director-General of Posts and Telegraphs.

ART. 20.

Meteorological Telegram, Time Signals, and other Signals.

The licensee is obliged to adhere to the rules which are made by or on behalf of the Minister of Waterways with reference to meteorological telegrams, time signals, and other signals.

ART. 21.

Authorisation and Obligations Outside the Territorial Waters of the (Dutch) Kingdom.

Outside the territorial waters of the Kingdom the rules of this licence are valid in so far as they are not contradictory to the Laws and Regulations which hold good in the locality in question.

ART. 22.

Other Rules and Regulations.

Moreover, the licensee is subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy which are prescribed or will be prescribed by Dutch law; by the Convention and the Regulations; or by any other International agreement to which Holland accedes or will accede; as well as to any modifications which may be deemed necessary for the execution of such Regulations.

ART. 23.

Annulment of the Concession.

The concession may be revoked by us:

1. If the ship's station has not been erected within one year from the granting of the concession.
2. By non-observance of the prescriptions of the telegraph and telephone code, 1904 (State Paper No. 7), of the terms in accordance with which this concession is granted, or of any stipulation of the national or international legal prescriptions described in this document.
3. If the ship mentioned in the licence ceases to be a Dutch ship.

ART. 24.

Further Obligations of the Licensee.

A. *First Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this licence is introduced, also when the ship on which the station has been fitted is out of commission or changes owners.

B. *Second Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this licence is introduced; also when the ship on which the station has been fitted is out of commission or changes owners.

C. *Third Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs if the ship on which the station has been fitted is out of commission or changes owners.

ART. 25.

Violation of Rules.

In addition to the withdrawal of licence mentioned in Art. 23, except in cases of *force majeure*, the licensee is fined from F. 10 to F. 1,000, at the discretion of the Minister of Waterways, for each violation of any rule laid down in this licence, of the said national or international legal prescriptions, as mentioned herein, and is fined from Fl. 1 to Fl. 100 for each day, after the period fixed for paying the fines, that he fails to adhere to the rules of this agreement.

Dating from the day on which the decision to withdraw the licence in consequence of Art. 23 has been taken, fines are no longer due. This article may be applied immediately. The said Minister decides the legal grounds for administering a fine; or the legality of a claim on grounds of *force majeure*.

In addition to the fine, the said Minister will decide to what cause the violation is due, to enable him to take action according to the contents of Art. 12 of the Regulations.

ART. 26.

Acceptance.

A declaration of agreement must be forwarded to the Director-General of Posts and Telegraphs, within the period fixed by him, intimating an acceptance of the terms of this licence.

LICENCE FOR EXPERIMENTAL STATION.

G A licence has been granted to for use of wireless telegraphs and telephones, which are installed in the premises situate at in under the following conditions and in virtue of his undertaking to pay the costs, make good the loss and pay the interest which may be found to arise therefrom.

ART. 1.—The licence is granted until further notice.

ART. 2.—The use of the wireless telegraphs and telephones is limited to the carrying out of experiments.

ART. 3.—If the wireless telegraphs and telephones are used in such a way that energy is radiated outwards beyond the precincts of the premises, this may only be done by means of transmitter for continuous waves of metres. The holder of the licence is under obligation, in the case of such use being made of the installation, to employ a receiver in the premises where the experiments are being conducted during the whole period of the carrying out of the experiments, which is capable of receiving damped waves of a length of 600 metres, so that any demand made by any station, in accordance with Art. 4, may be complied with.

The call letters to be used are and these must be repeated times at the commencement and on the conclusion of the experiments.

Furthermore, the holder of the licence is under obligation to have in his said premises a telephonic connection with the local telephone service.

ART. 4.—All the radiation of electrical energy is immediately stopped whenever, with an eye to the interests of the national telegraph and telephone service, this may be thought necessary by the national stations concerned, and by the term "service" is to be understood the service of all the national stations including those belonging to departments other than the department of the Minister of Waterways.

ART. 5.—The experiments may be conducted on from to

ART. 6.—The holder of the licence shall pay to the Government a fee of 100 florins per week—hour per annum.

ART. 7.—The use of the wireless telegraphs and telephones may be suspended wholly or in part whenever this is thought to be necessary in the general interest by the Minister of Waterways.

The work may be interrupted temporarily on the authority of the Director-General of Posts and Telegraphs during parts of the hours in which the experiments are being conducted.

ART. 8.—All licensees are under obligation to carry out the provisions which may be required by or on behalf of the Minister of Waterways within the period stipulated by the latter.

ART. 9.—The officers who are to be appointed by the said Director-General of Posts and Telegraphs are charged with the superintendence of the wireless telegraphs and telephones.

In this connection access to the wireless telegraphs and telephones must be permitted at all times to the officers referred to.

ART. 10.—No use may be made of the licence before it has been accepted by means of a declaration to be handed in before the

ART. 11.—The holder of the licence is liable at the discretion of the Minister of Waterways to a penalty of Fl. 100 to Fl. 1,000 for each violation of any stipulation of this licence, and to a further penalty of Fl. 1 to Fl. 100, likewise at the discretion of the said Minister of Waterways for every day after the lapse of the period named on the imposition of the major penalty in which he continues in default or in the act of violation of the stipulation referred to.

No act of default is necessary for the application of the stipulation contained in this article.

The said Minister decides upon the existence of the grounds for the imposition of the penalty and the amount of the penalty, as well as the justification there may be for an appeal for reasons of *force majeure*.

ART. 12.—Without prejudice to the provisions indicated in the foregoing, the prescriptions for installations which are exclusively suitable for the reception of wireless telegraph and/or wireless telephone signals, as laid down by the Minister of Waterways (instruction of the 8th August, 1921, No. 1, Department of Posts and Telegraphs) in virtue of the stipulations contained in Art 2 *bis* of the Royal Decree of the 6th March, 1905 (Staatsblad 90), recently modified by Royal Decree of the 9th July, 1921 (Staatsblad 903), remain in application.

DECREE No. 622

RECEIVING ARRANGEMENTS FOR RADIOTELEGRAPHY AND RADIOTELEPHONY.

H By Royal Decree of July 9th, 1921 (Staatsblad No. 903), of which the text is given below, the Minister of Waterways is given authority to make regulations with which apparatus exclusively intended for receiving wireless telegraphic and telephonic signals shall comply, and furthermore penalties are decreed for non-observance of the rules.

Text of the Royal Decree of July 9th, 1921 (Staatsblad No. 903), containing supplement to and alteration of the Royal Decree of March 6th, 1905 (Staatsblad No. 90), finally revised in the Royal Decree of November 15th, 1919 (Staatsblad No. 753).

ART. 1.—After Article 2 of our Decree of March 6th, 1905 (Staatsblad No. 90) is inserted an Article 2 *bis* as follows:—

Without prejudice to the enactments of the preceding Article the possession and the use of apparatus which are exclusively fitted for the receipt of radiotelegraphic and radiotelephonic signals are only granted subject to observance of the regulations which shall be made by Our Minister of Waterways.

ART. 2.—Article 4, first paragraph, of Our above-mentioned Decree, is to be read as follows:—

The officials of the Royal and Municipal Police, and the Inspectorate of the coastal and ships' wireless telegraphy, the chief engineers and engineers, electrotechnical head officials and officials of the Telegraph Service are charged with the maintenance of the general rules prescribed by the Government.

ART. 3.—In Article 5 of the Decree as given by Us the words "the Articles 1 and 2" are replaced by the words "the Articles 1, 2 and 2 *bis*."

Art. 4.—This Decree comes into force on the second day from the date of the Staatsblad in which it appears.

The Decree came into force on August 7th, 1921.

The regulations of Art. 1 heretofore mentioned are:—

Text of the Ordinance of the Minister of Watersways of August 8th, 1921, No. 1, Department of Posts and Telegraphs.

ART. 1.—In this Ordinance is understood:—

By "Minister," the Minister of Watersways.

By "Director-General," the Director-General of Posts and Telegraphs.

By "signals," radiotelegraphic or radio-telephonic signals of any kind.

By "receiving apparatus," apparatus maintained by or used by others than the State which are exclusively designed for receiving radiotelegraphic and/or radio-telephonic signals.

ART. 2.—It is forbidden to take note in any way of signals received which are intended for another, or to communicate their contents, the substance of them or their existence to a third party or to allow them to be so communicated.

ART. 3.—Users of receiving apparatus must observe all orders which are directed to them with reference to the apparatus by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephone Act, 1904 (Staatsblad No. 7) by the military authorities.

ART. 4.—The receiving apparatus are subject to any control which is deemed necessary by the Director-General or, in the case set forth in Article 18 of the Telegraphs and Telephones Act, 1904 (Staatsblad No. 7), by the military authorities.

The officials appointed by or on account of the Director-General or the authorities must always be allowed to inspect the apparatus, and note all that has bearing on what is received.

ART. 5.—Users of receiving apparatus must give notice of its presence to the local Director of the Royal Telegraph Office or to a neighbouring Post Office if there is not one in the town. This is to be done by means of a form which can be obtained from all post offices free of cost.

On this form when completed must be shown:—

1. Surname and Christian names of the user of the apparatus, the date and the year of his birth, his town and address, and exact indication of where the apparatus is situated.

2. It must be stated whether valves or other apparatus are used which can send out waves obstructing wireless traffic.

3. That the user is acquainted with the regulations governing the use of the apparatus, and that he accepts them unconditionally. When the form is sent in an acknowledgment of receipt is issued by the Director of the Post Office in question. The user must be able to produce this receipt at all times, and in default it will be assumed that no form was completed.

NEW ARTICLE OF PENAL CODE RELATING TO VIOLATION OF SECRECY OF WIRELESS CORRESPONDENCE.

Penal Code.

I ART. 441.—"Any person who communicates to another the contents of a message which has been received by means of a receiver which is under his charge or which is used by him for purposes of wireless telegraphy or telephony, when he has reason to

suppose that such message is neither intended for him nor for the information of the public and if he has reason to believe that by so doing the contents of such message may be brought to the notice of the public and if such a publication actually takes place, or who makes public the contents of such message, is punishable by imprisonment for a period not exceeding three months or by a fine not exceeding 1,000 florins."

REGULATIONS FOR TELEGRAPHIC SERVICE IN THE DUTCH COLONY OF CURAÇAO.

Public Notice No. 52 of 1909. (21st September.)

J The Governor of Curaçao, in view of the desirability of replacing by new regulations the decree of the 30th October, 1873, regulating the inland and foreign telegraph communication of the colony as well as that of the 27th September, 1884, regulating telephonic communication, and having received the sanction of the Colonial Council, has determined on the following decree:—

ART. 1.—In this decree it is understood that telegraphs and telephones refer to the usual line-telegraphs and telephones as well as to radiotelegraphs and telephones.

ART. 2.—No telegraphs and telephones may be installed on any of the islands of the colony by others than the Government, unless a special permit is granted. Besides the special conditions, made in each case, the general rules are:—

(a) The erection, maintenance and exploitation should be carried out to the satisfaction of the Governor.

(b) The tariffs, conditions of use and service regulations must be submitted for the approval of the Governor.

(c) The concession may be granted absolutely or conditionally, but for no longer period than 25 years.

(d) The concession may be withdrawn by the Governor if the above rules or the special conditions are not followed.

ART. 3.—It is forbidden, without the permission of the Governor, to use radiotelegraphs or telephones, fitted on board foreign or private-owned Dutch ships, in the ports or anchorages of the colony, unless in special circumstances, the exigencies of good seamanship render it necessary to do so.

ART. 4.—Everybody may make use of telegraphs and telephones under the existing regulations. The transmission of telegrams or the conversation by telephone may be stopped or refused if, in conflict with the safety of the colony, public order, or common decency.

The reasons for refusal or stoppage should be communicated to the party concerned.

The decision of the Governor may be invoked in such cases.

ART. 5.—For the public interest the Governor may put telegraph and telephone service under control or partially suspend it for an indefinite period.

ART. 6.—In case of war, or if any of the islands of the colony be placed under martial law, if so desired the telegraphs and telephones may be put under Government control.

ART. 7.—Imprisonment of one day to six months and fines from 10 florins to 1,000 florins conjointly or separately will be inflicted on those who erect or exploit telegraphs and telephones, without the permission required as specified in Art. 2; or who on board private-owned ships, make unlawful use of the same (Art. 3).

The instruments may, in so far as they are owned by the guilty parties, be confiscated.

ART. 8.—Anyone who wilfully damages or destroys telegraph and telephone works, including cables, in use for public benefit, will be punished with imprisonment from three months to three years.

Anyone who causes such damage as is referred to above, through neglect, may be punished with imprisonment of one day to one month or a fine of 1 florin to 100 florins.

ART. 9.—Deals with the punishment of crimes committed in which telephones are used.

ART. 10.—Libellous, offensive and indecent expressions used over the telephone, will be considered as uttered in public.

ART. 11.—Violation of the secrecy of telegraphs and telephones is punishable in accordance with Arts. 137 and 327 of the existing law.

ART. 12.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ARTS. 13, 14, 15 and 16 deal with the use of private property in the erection of telegraph and telephone lines.

ART. 17.—All precautions should be taken to prevent lightning being conducted along cables or lines.

ART. 18.—The above may be referred to as "Telegraaf- en Telefoon-Verordening 1909," adding the number of the publication.

ART. 19.—Decrees of 30th October, 1873 (P.B. 1874, No. 1) and of 27th September, 1884 (P.B. 1884, No. 14) as well as P.B. 1982, No. 27, are withdrawn.

ART. 20.—Concessions relating to the erection of telegraphs and telephones on any of the islands of the Colony of Curaçao, granted before this decree comes into force, will be treated as coming under the regulations in force when they were made.

PUBLIC NOTICE.

No. 25 of 1923. (3rd March).

IN THE NAME OF THE QUEEN

THE GOVERNOR OF CURAÇAO.

K In view of the fact that it is desirable to amplify and to modify the Penal Code for the Colony of Curaçao and, in conjunction therewith, the order of 21st September, 1909 (Public Notice No. 52), relating to the installation, exploitation and use of telegraphs and telephones in the Colony of Curaçao, as modified by the Importation Order Penal Code (Public Notice 1918, No. 6);

Has, after obtaining the approval of the Colonial Council, made the following order:—

SECTION I.

ART. 1.—In Section IX of the first book of the Penal Code for the Colony of Curaçao, after article 95 *bis* is inserted a new article 95 *ter*, of the following tenor:—

The term electrical appliances, includes appliances serving to produce, conduct, transform or supply electricity, and the safety, fastening, supporting and alarm devices connected therewith.

Telegraph and telephone appliances are not included in the term electrical appliances.

ART. 2.—After Article 167 of the said Code, are inserted two new articles, of the following tenor:—

ART. 167 *bis*.—Anyone who wilfully destroys, damages or renders unfit for use any electrical appliance, or causes defects in the running or the working of such appliance, or interferes with any safety measures taken in connection with such appliance, will be punished:

1. By imprisonment for a term not exceeding six months or a fine not exceeding three hundred gulden, if stoppage or irregularity of the current supply for the general use is thereby caused;

2. By imprisonment for a term not exceeding six years, if general prejudice to property is to be apprehended thereby;

3. By imprisonment for a term not exceeding nine years, if the life of another person is endangered thereby;

4. By imprisonment for a term not exceeding fifteen years, if the life of another person is endangered thereby and the act results in the death of any person.

ART. 167 *ter*.—Anyone by whose fault it happens that any electrical appliance is destroyed, damaged, or rendered unfit for use, that defects arise in the running or the working of such appliance, or that any safety measures taken in connection with such appliance are interfered with, will be punished:

1. By imprisonment or detention for a term not exceeding three months or a fine not exceeding three hundred gulden, if stoppage or irregularity of the current supply for the general use or general prejudice to property is thereby caused;

2. By imprisonment or detention for a term not exceeding six months or a fine not exceeding three hundred gulden, if the life of another person is endangered thereby;

3. By imprisonment or detention for a term not exceeding one year, if the act results in the death of any person.

ART. 3.—In Articles 170 and 171 of the said Code, in place of the words "the traffic by steam power over a railway track," the words "the traffic by mechanical power over a railway track," are to be read.

ART. 4.—In Article 368 of the said Code, in place of the words "railway or telegraph appliances," the words "railway, telegraph, telephone or electrical appliances" are to be read, and the word "electricity" is withdrawn.

ART. 5.—To Article 387 of the said Code, a new second paragraph is added, of the following tenor:

The same penalty will be applicable to the official who, by exceeding his authority, obtains through an official of telephony, or through other persons in charge of the service of a telephone installation for the general use, information about any conversation which has taken place through the medium of the installation.

ART. 5.—After Article 390 of the said Code is inserted a new article, of the following tenor:

ART. 390 *bis*.—Any official of telephony, or any other person entrusted with the supervision or the service of a telephone installation for the general use, who wilfully and unlawfully communicates to another person the substance of a conversation carried on through the medium of telephony or of such installation, will be punished by imprisonment for a term not exceeding one year and six months.

ART. 7.—Article 391 of the said Code is to be read as follows:

Any official of any public establishment of communication or of telegraphy or telephony, or any other person mentioned in Article 390 or Article 390 *bis*, who wilfully allows another to commit any of the acts stated in Articles 388-390 *bis*, or that other is concerned as an accomplice in the same, will be liable to the penalties in their various degrees as laid down by these provisions.

ART. 8.—After Article 460 of the said Code, is inserted a new article, of the following tenor :

ART. 461.—Detention for a term not exceeding three months or a fine not exceeding one thousand gulden will be inflicted upon anyone who either communicates to another the purport of any communication that is received through the medium of a receiving set for wireless telegraphy or telephony which is under his control or used by him, when he has good reason to suppose that it is not intended for him nor the public, and if he has good reason to suppose that public knowledge of the purport is then bound to follow and such knowledge does in fact follow, or who makes it publicly known.

SECTION 2.

ART. 9.—The order of 21st September, 1909 (Public Notice No. 52), relating to the installation, exploitation and use of telegraphs and telephones in the Colony of Curaçao, as modified by the Importation Order Penal Code (Public Notice 1918, No. 6), receives the following amplifications and modifications :

I. After Article 3, is inserted a new article of the following tenor :

ART. 3 *bis*.—Unless the consent of the Governor is obtained thereto, it is forbidden to install and make use of any transmitting set or receiving set for radio telegraphy or telephony for which no licence has been granted.

With regard to receiving stations for radio-telegraphy or telephony, the necessary consent to the installation and making use of the same will, however, be withheld or revoked only when a state of war or the menace of war gives occasion therefor and when there is good reason to suppose that misuse of the same will be made or is in fact being made.

II. Article 7 is to be read as follows :

Imprisonment for a term not exceeding six months or a fine not exceeding one thousand gulden will be inflicted upon :

1. Any person who installs or uses telegraphs or telephones without the licence required by Article 2 ;

2. Any person who on board of private vessels is guilty of contravention of the prohibition mentioned in Article 3 ;

3. Any person who makes use of a transmitting set or receiving set for radiotelegraphy or telephony for which no licence has been granted, without the consent referred to in Article 3 *bis*.

The telegraph and telephone lines, together with the apparatus used for transmission or reception of telegrams or conversations, may, in so far as they belong to the offender, be confiscated.

SECTION 3.

ART. 10.—This order comes into force on the day following that of its publication.

Given at Willemstad, March 3rd, 1923.

BRANTJES.

The Secretary of State,
BOOMGAART.

Published on June 4th, 1923.

The Secretary of State,
BOOMGAART.

REGULATIONS FOR TELEGRAPH SERVICE IN THE DUTCH EAST INDIES.

6th October, 1876.

L The old regulations issued by decree of 31st March, 1858, concerning the electro-magnetic telegraphs should now be superseded and new regulations as hereunder be brought into force.

Regulations concerning the erection and use of telegraphs in the Dutch East Indies.

ART. 1.—No telegraphs may be erected or used without permission of the Government, except those exclusively owned and used privately.

ART. 2.—The conditions for permission to erect such telegraphs will be fixed in each case separately.

ART. 3.—The Governor-General has the right to take possession of all telegraphs or to stop their exploitation.

ART. 4.—If telegraphs are erected without permission open for public traffic, a fine of from 200 florins to 1,000 florins can be inflicted.

ART. 5.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ART. 6.—They should give access to officials and not interfere with the work done and the lines erected.

ART. 7.—If they refuse access they will be fined from 25 florins to 100 florins.

ART. 8.—They have a right to compensation or damage done to their property.

ART. 9.—Everybody has a right to have telegrams sent under the conditions laid down in the service regulations.

ART. 10.—The State or the Telegraph Company is not responsible for the transmission of telegrams in general or within a certain time.

ART. 11.—Punishment for embezzlement or opening of telegrams, communication of their contents to outsiders, etc., will be inflicted in accordance with the existing laws.

ART. 11a.—Telegrams, the contents of which are of danger to the State, or in conflict with the law, or of an obscene character, will not be accepted or delivered.

ART. 12.—Punishment in accordance with the existing laws is to be inflicted on every official who falsifies telegrams and on those who knowingly profit by the misuse of such telegrams.

ART. 13.—Damage to telegraph works or material is punishable with imprisonment and penal servitude.

ART. 14.—The Head of the Local Council may order, on request of the Chief of the Telegraph Service, the removal of everything impeding the efficiency of that service.

The above was published in the *Official Gazette (Staatsblad)* of the Dutch East Indies, and the regulations also apply to Telegraphs or Telephones, whereby the apparatus at both ends is not connected with wires or conductors (Decree of 7th December, 1903. *Staatsblad*, No. 405, Supplemented by Decree of 8th September 1906. *Staatsblad*, No. 403).

HONG-KONG

(See Maps 17 and 20).

HONG-KONG consists of a number of islands situated off the south-eastern coast of China, at the mouth of the Canton River, and of a portion of the adjacent mainland. It is administered as a Crown Colony

under a Governor, aided by an Executive Council of nine members, and a Legislative Council of thirteen.

CONTROL AND ORGANISATION.

Hong-Kong possesses four radio stations. Stonecutters Naval Radio Station is used almost entirely for naval purposes, but also transmits time signals for the Royal Hong-Kong Observatory; Cape D'Aguilar Radio Station used for any purpose, *i.e.*, naval, Government, commercial, but primarily for the public service; A small station, $\frac{1}{2}$ -kW. Marconi type, set on Gap Rock, used for communication between the Rock and mainland when necessary; and a direction finding station.

A receiving installation is fitted in the Royal Observatory, and is used for the reception of time signals from other observatories.

Weather reports are issued daily from the Royal Observatory, and transmitted by the Cape D'Aguilar station at the following hours—G.M.T. 0500, 0900, 1200—on a wavelength of 600 metres.

Typhoon warnings are transmitted by this station on receipt from Royal Observatory, and repeated at each even hour, *i.e.*, noon, 2 p.m., etc.

Navigation warnings are transmitted on receipt from harbour master, and repeated after daily weather report.

Navigation warnings received from ships are immediately broadcast by this station, and repeated after daily weather report.

Time signals are transmitted twice daily by Stonecutters (naval station), commencing at 0156 G.M.T. until 0200 G.M.T., and from 1256 G.M.T. until 1300 G.M.T., on a wavelength of 2,000 metres.

Gap Rock, when required, or during typhoon, forwards hourly observations to Royal Observatory via Cape D'Aguilar.

The direction finding station gives bearings on a wavelength of 800 metres normally, but ships not fitted to transmit on this wave may request bearings on a 450 or 300 metre wavelength by arrangement with Cape D'Aguilar "V.P.S." on a 600 metre wave.

Hong-Kong time is eight hours ahead of G.M.T.

No licences have yet been issued for amateur stations, but the Hong-Kong Amateur Radio Society has, with the permission of the Government, been recently formed.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. T. Creasy ..	Director of Public Works	P.W.D. Hong-Kong
Mr. H. E. Goldsmith	Executive Engineer	P.W.D. Hong-Kong
Mr. S. Bradshaw ..	Superintendent of Cape D'Aguilar Wireless Station	P.W.D. Hong-Kong

ADMINISTRATION.

The regulation of wireless telegraphy is carried on under the provisions of the Wireless Telegraphy Ordinance, 1913, passed on July 25th of that year, which repealed all previous Ordinances; and by regulations issued under that Ordinance.

A—The Wireless Telegraphy Ordinance, 1913.

B—Regulations.

C—Ship Licence.

D—Permit to use wireless telegraphy on ships in the harbours of the Colony.

ORDINANCE No. 20 OF 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" as (defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a licence granted in that behalf by the Governor.

(ii) Every such licence shall be in such form and for such period as the Governor-in-Council may determine and shall contain such terms, conditions, and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor-in-Council may make regulations for all or any of the following matters:—

(a) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(b) For prescribing the fees payable on the grant of any licence;

(c) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the colony

shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) For prohibiting, except with the special or general permission of the Colonial Secretary, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the colony;

(e) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(ii) Provided that no regulations made in respect of the matters described in paragraphs (c), (d), and (e) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures, and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. The Wireless Telegraphy Ordinance, 1903, the Wireless Telegraphy Ordinance, 1909, and the Wireless Telegraphy Amendment Ordinance, 1909, are hereby repealed.

B REGULATIONS made by the officer Administering the Government in Council under the provisions of Section 6 of the Wireless Telegraphy Ordinance No. 20 of 1913, on November 20th, 1913:—

1. Any person desirous of obtaining a licence for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony, or on board any British ship registered in the colony, must apply in writing

to the Colonial Secretary. Such application must contain full particulars—

- (a) Of the place or ship in respect of which a licence is sought;
 - (b) Of the nature of the apparatus which it is desired and proposed to install and work; and
 - (c) Of the purposes for which the installation is intended to be utilised.
2. The following shall be the fees payable on the grant of licences:—
- | | |
|--|--------|
| (a) For a licence under Section 3 for a land station | \$2.50 |
| (b) For a licence under Section 3 for a ship station | \$2.50 |
| (c) For an experimental licence under Section 7 | Nil |

3. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with—

- (a) Naval signalling; or
- (b) The working of any wireless telegraph station lawfully established, installed, or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Colonial Secretary of the colony.

5. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that his Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. No proceedings shall be taken against any person under these regulations except with the previous sanction of the Attorney-General.

REGULATIONS MADE BY THE GOVERNOR IN COUNCIL UNDER SECTION 4 (2) AND SECTION 6 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913, ORDINANCE NO. 20 OF 1913, THIS 24TH DAY OF FEBRUARY, 1921.

Published in the Government Gazette of the 4th March, 1921, Government Notification No. 78.

1. The licence required under the Wireless Telegraphy Ordinance, 1913, Ordinance No. 20 of 1913, for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy on board any British Ship registered in the Colony of Hong-Kong shall be in the form set out in first schedule hereto.

2. The special or general permission of the Colonial Secretary required under Regulation 4 of the Wireless Telegraphy Regulations published on pages 906 and 907 of the "Regulations

of Hong-Kong, 1914," shall be in the form set out in the second schedule hereto and the fee for such permission shall be two dollars.

3. The forms of licence and permit prescribed in Government Notification No. 353 published in the *Gazette* on the 6th day of August, 1915, are hereby repealed.

S. B. B. McELDERRY,
Clerk of Councils.

COUNCIL CHAMBER,
24th February, 1921.

FIRST SCHEDULE.

SHIPS.

Dated the .. day of .., 19 ..
THE WIRELESS TELEGRAPHY ORDINANCE, 1913.
(HONG-KONG.)

His Excellency the Governor of the Colony of Hong-Kong
To

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come I

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same send greeting:

Whereas

of (hereinafter called "the licensee") is desirous of establishing installing working and using on a ship or ships belonging to the licensee Wireless Telegraphy as defined in Section 2 of the Wireless Telegraphy Ordinance, 1913:

And whereas by reason of the provisions of the Wireless Telegraphy Ordinance, 1913, it is unlawful to establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor:

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses, powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above named

Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee from the date hereof so long as the Wireless Telegraphy Ordinance, 1913, shall continue in force unless and until these presents and the licence or permission hereby given shall be determined as hereinafter provided licence and permission—

(i) To establish, install and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Provided that—

(a) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to Radiotelegraph Convention, 1912, as is specified in the said Schedule opposite to the name of such station;

(b) The apparatus installed at each ship station shall be of the character specified in the said schedule opposite to the name of such station;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(d) The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraph Convention, 1912;

(e) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Government of the Colony for the time being or as may be otherwise directed by the Governor and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Governor; Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912; Provided further that only the wavelength of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(f) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word.

(g) Each ship shall be provided with two certified operators together with suitable accommodation for the apparatus and operators and a wireless service shall be maintained at all times during the period of this licence.

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations, and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with the consent in writing of the Colonial Secretary of the Colony send or receive messages from and at the said ship stations when in any of the harbours of the Colony; and

(iii) To receive money or other valuable consideration for or in respect of the use of the license apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said licence and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the officer of His Majesty's Navy who is for the time being in Hong-Kong in charge of the China Squadron of His Majesty's Eastern Fleet.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th/22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraph Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the despatch or receipt of messages except messages authorised by this licence.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) If the Admiralty is of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall, when required in writing by the Governor so to do close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this licence the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor in Council in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions, claims and demands, which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this licence the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of change, order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall so far as possible receive from ships and light stations all request for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12. (1) The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion and the licensee shall provide for the working of each station such operators as are required by the provisions of Article X of the Service Regulations annexed to the Radiotelegraph Convention, 1912, according to the class of the ship station and shall observe the regulations as to the working of the ship station laid down according to its class by Article XIII of the said Regulations.

(2) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this licence unless it bears a statement that it is issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion in accordance with the Radiotelegraph Convention, 1912. Such certificates will be valid only during the operation of the said Convention. When issued by the Governor such certificates will be granted to persons of such technical proficiency and will be in such form and will be subject to such conditions as the Governor shall from time to time prescribe and they may be, by whomsoever issued, endorsed or withdrawn at the discretion of the Governor in the case of misconduct or breach on the part of the holder of the regulations prescribed for the working of ship stations.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act, 1884, and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this licence entitling the Governor under Clause 22 hereof to revoke and determine this licence.

14. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Governor shall from time to time reasonably require to be shown; messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention, 1912, and such registers and message papers shall be open to the inspection of the Governor or his officers thereto authorised at the office of the licensee in Hong-Kong or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a general or public holiday.

15. The licensee shall render to the Governor such accounts as the Governor shall direct in respect of all charges, if any, due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Colonial Treasurer at such times and in such manner as the Governor shall direct all sums which shall be due from the licensee under such accounts.

16. The Governor and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instrument respectively.

17. The licensee shall carry on every ship on which a ship station is established under this licence a print or copy of the licence certified under the hand of the Colonial Secretary of the Colony of Hong-Kong or appropriate officer of the Postmaster-General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The

licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention, 1912.

18. (1) The licensee shall pay to the Colonial Treasurer for and in respect of the licence hereby granted a royalty of \$25 per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st of December in each year during which the licence remains valid.

19. Except with the consent in writing of the Governor the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licences, powers or authorities hereby granted or any of such licences, powers or authorities.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval, Military, Customs or Police officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. At any time after the _____ day of _____, 192____, the Governor may in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice

to any remedy of the Governor under any condition or provision herein contained.

22. In any of the following cases (that is to say) :—

(a) In case any sum of money which ought to be paid by the licensee to the Colonial Treasurer under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained.

then and in any such case the Governor may by notice in writing under his seal revoke and determine these presents and the licences, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licences, powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Governor under any condition or provision herein contained.

23. Nothing in these presents contained shall prejudice or affect the right of the Governor from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit And (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor or any other person by or under any Imperial or local enactment or by or under any agreement relating to the transmission of messages by ordinary land and submarine telegraphy.

24. Any notice request or consent (whether expressed to be in writing or not) to be given by the Governor under these presents may be under the hand of the Colonial Secretary of the Colony of Hong-Kong and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the Licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Hong-Kong.

As Witness my hand and seal this..... day of..... One thousand nine hundred and.....

THE SCHEDULE OF SHIP STATIONS BEFORE REFERRED TO.

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraphic Convention, 1912.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		If Alternator is used, Number of Cycles per Second.
				By Night.	By Day.	System of Radio-telegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken in Sending Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

SECOND SCHEDULE.

Audit No.

G. R.

PERMIT TO WORK AND USE APPARATUS
FOR WIRELESS TELEGRAPHY ON BOARD A
MERCHANT SHIP IN THE HARBOURS OF THE
COLONY

The Wireless Telegraphy Ordinance, 1913.

D

Section 6 (1) (iv).

Permission is hereby given for the working and using of apparatus for wireless telegraphy on board the ships of the specified in the Schedule hereto whilst such ships are in any of the harbours of the Colony subject nevertheless to the following conditions, namely:—

CONDITIONS.

1. This permit may be cancelled or suspended at any time by the Governor in his absolute discretion and without any reason being assigned therefor.

2. All such vessels shall obey promptly the "naval silence sign" (— • • • • — • • • —) and thereupon shall not work or use their wireless telegraphy apparatus until after the "Message Complete Sign" (• • • — • —) shall have been made.

3. The above company shall render every assistance possible as required by the Postmaster-General by furnishing information in respect of incoming mails carried by the ships of the said company.

4. All information received as to the weather being experienced by the vessels of the said company at sea must be forwarded to the Harbour Office for transmission to the observatory or sent to the observatory direct whichever may be the more expeditious. The information should give the date and time of the observation, the position of the ship, the reading of the barometer, the direction and force of the wind, and the state of the sea and weather.

Dated at Hong-Kong, this day of

19

Fee \$2 received

Colonial Secretary.

SCHEDULE.

Colonial Secretary.

HONDURAS

(See Maps 35, 43 and 44.)

Including: Swan Island.

HONDURAS is a Republic, proclaimed September 15th, 1821, and is governed under a charter proclaimed October, 1894. The Legislative Power is in the hands of a Congress of Deputies. The executive authority rests with the President, nominated and elected by popular vote for four years. The Republic is administered by a Council of six ministers.

Swan Island is situated in the Caribbean Sea, some 90 miles North-west of Honduras. It has no harbour and is difficult to approach in all but calm weather.

CONTROL AND ORGANISATION.

The present stations belong to private companies, and are without any co-ordination, being used only by the various companies to maintain communication with their own steamers. Under favourable atmospheric conditions

they can work with New Orleans, but ordinarily they communicate with the Isla del Cisne (Swan Island), in the Caribbean Sea. They are more or less of the type of that at Tela, which has a transmitter of 5 kW., and aërials sustained by towers 250 feet high.

The Government has recently ordered a course of wireless to be included in the studies of the Ministry School at Tegucigalpa, and has installed an instructional set.

The owners of Radiotelegraphic stations situate on Swan Island are the United Fruit Co., who have there a relay station between New Orleans and Burrwood La., and their plantations in Columbia, Panama, Nicaragua, and the Gulf. This station on Swan Island was entirely re-equipped in 1912 by the Marconi Wireless Telegraph Company of Canada.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address</i>
Excmo. Señor don Jesus M. Alvarado	Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa
Licenciado don Antonio Castillo Vega	Sub-Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa

ADMINISTRATION.

According to the Law of Telegraphs of the Republic, this branch of Telegraphy is the exclusive right of the State, but this right has been made over to private companies on the north coast in the form of concessions.

A Decree of July 16th, 1920, declares the necessity of providing a modern and effective service of communication to aid international and official relations and to provide a news service.

To this end the sum of two hundred and fifty thousand colones has been voted for the purchase and installation of a radiotelegraphic and radiotelephonic station, situated preferably at the capital of the Republic, of sufficient power to communicate with places where radiotelegraph, radiotelephone, cablegraph or telegraph stations may be open for public service. Also from this same sum a number of smaller stations in the scattered regions of the National territory and preferably in the Cantons of Osa, Puntarenas, Liberia, and Sixaola are to be provided.

The following are the conditions under which private companies are granted concessions to install and work radiotelegraphic and radiotelephonic apparatus:—

“The concessionaire has the right to construct, maintain and use wireless stations in order to direct the service of his steamships and those chartered by him. Such stations must not be used for public service without previous arrangement with the Government. The Government shall have the right in times of peace or war to use such installations, without remuneration for the concessionaire, and even to direct and exclusively control the service of same, by its own employees.”

These concessions granted by the Government were approved by Congress.

HUNGARY

(See Maps 8, 13 and 14.)

HUNGARY is a kingdom under a Regent styled officially “Protector of the Magyar Republic.”

CONTROL.

Radiotelegraphy is at present controlled by the Director-General of Posts and Telegraphs who is responsible for the promulgation of all laws and regulations relative thereto.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mons. Charles Demény	Secretary of State and Director-General of Posts and Telegraphs	Budapest

ORGANISATION.

A large station, with a range of 3,000 km., situated at Csepel, near Budapest, was established on November 18th, 1914, and during the year 1921 was equipped with a 5-kW. valve C.W. transmission set. Traffic can now be sent either by this or the old quenched spark equipment. This has been augmented by a special station to receive news, etc., messages from Nauen.

Considerable radiotelegraphic and telephonic developments are in course of development. Wireless apparatus has been installed in many of the schools throughout the country. A new 1-kW. station was open in 1923 at the Aerodrome in Matyasfold, near Budapest, for communication with airships and the transmission of meteorological reports on a wavelength of 900 metres C.W.

ADMINISTRATION.

A law concerning aviation in connection with radiotelegraphy is in course of preparation, but detailed particulars are not yet available.

Radiotelegraphy is governed by the following law, the text of which is printed below:—

A—Decree No. 62574/13, dated October 16th, 1913.

B—Form of ship Licence thereunder.

C—Form of Certificate for Ship Stations.

D—Form of Certificate for Operators.

E—Form of Licence for Private Receiving Station.

DECREE OF THE HUNGARIAN MINISTER OF COMMERCE WITH REFERENCE TO THE FITTING UP OF WIRELESS STATIONS ON HUNGARIAN SEA-GOING PASSENGER SHIPS.

A In accordance with paragraphs 24 and 27 of the Supplement to my Order No. 60,805, issued on August 21st of the current year, in the matter of authorising the placing of service of commercial sea-going ships, the safety appliances provided on them and the provision of the navigation service in connection with working them, passenger lines already in service, which make regular voyages from Hungarian ports to points beyond Gibraltar or Aden and are carrying passengers, are to be fitted with wireless apparatus of the description specified below not later than by February 1st, 1915; new ships, on the other hand, must be fitted with such apparatus before they are put into service. Such apparatus must be sufficiently powerful to be able to send or receive messages under ordinary conditions over a minimum distance of 100 sea miles.

In order to carry out this decree I order the following:—

1. The owner (or charterer) is obliged to apply to the Hungarian Minister of Commerce for permission to establish a wireless station on board.

Such application must be accompanied in quadruplicate by a technical description of the apparatus to be used, with a diagram of the connections. Any subsequent alteration in the system, or remodelling of any description of the apparatus, which may affect its capacity

for sending or receiving messages, must receive the preliminary authorisation of the Hungarian Minister of Commerce.

2. The arrangement of the wireless station on the ship must be up to date and comply with Rule 3 of the London International Wireless Agreement, so that the station may be able to work in harmony with the working of wireless stations using other systems and be able to exchange messages with such other stations. The system to be adopted and to be used will depend on the preliminary authorisation of the Hungarian Minister of Commerce.

The apparatus must be of such a type that it can be adjusted for waves 300 and 600 metres long and with these be able to send or receive 20 words at least per minute, counting five letters to the word.

In the case of applying subsections 2a to 2d of paragraph xxxv of the London International Wireless Service Regulations, the apparatus on the ship will be allowed to make use also of wavelengths of 1,800 metres.

3. All the machinery and materials for fitting up the wireless station on the ship must be acquired in the home country as far as possible.

Machinery and materials to be used for such purpose may only be acquired from abroad with the special permission of the Hungarian Minister of Commerce. Service books and similar other stores and office requisites for the working of the wireless service will be supplied at cost price by the Chief Post and Telegraph Administration.

4. All ships fitted either for continuous or restricted wireless service must, in addition

the usual apparatus be fitted also with apparatus for sending out wireless distress signals in conformity with Rule xi of the London Wireless Service Regulations as ordered by and in a manner fixed by the Hungarian Minister of Commerce.

Such apparatus for sending out wireless distress signals must be provided with its own separate power supply independently of any other power supply not used for the wireless service on board and must be of a design that it can be put in action expeditiously and be kept at work continuously for at least six hours and at the same time be powerful enough to send signals over a distance of at least 80 sea miles, on ships having a continuous wireless service and over at least 50 miles on ships with restricted wireless service.

This special installation for sending out distress signals may be omitted on all ships on which the regular wireless installation is able to fulfil these requirements.

5. The speed at which signals can be sent and received will be set out by the Hungarian Minister of Commerce in the document granting permission to establish a wireless service on a ship.

As regards new inventions for materially improving the efficient working of the apparatus and the speed of sending and receiving messages, the Hungarian Minister of Commerce may compel the owner (or charterer) of the ship to adopt such invention or inventions within a fixed period for the wireless station on his ship with due regard to existing practical requirements and a fair consideration of the expenditure incurred in connection therewith.

6. Under ordinary conditions the electrical power for working the wireless apparatus may not exceed one kilowatt. A greater power than this may only be used if the nearest station on the coast with which it is desired to exchange messages is situated at a greater distance than 200 sea miles or if on account of obstacles extant it is necessary to use the larger power (London Wireless Service Regulations, Rule viii).

7. The Chief Post and Telegraph Administration is empowered to have the wireless installation examined by its own inspectors at any period and to control the service.

The owner (or charterer) of the ship is obliged to afford to the inspectors of the Chief Post and Telegraph Administration, and with the intervention of this Administration to officers appointed by the Navy every facility to make themselves thoroughly familiar with the working in every detail of the wireless apparatus and gear and to acquire the necessary practice in working the apparatus.

Any stipulation on the part of the supplier of the apparatus that certain parts or details of the apparatus are to be kept secret and not to be shown to the inspectors of the Chief Post and Telegraph Administration or to officers of the Navy must not be accepted by the owner (or charterer) of the ship.

All inspectors and naval officers deputed to control or learn the working of the apparatus must be carried on the ship cost free by the owner (or charterer) of the ship in a class corresponding to their rank (with cabin accommodation in accordance therewith also free) and to charge them for their board at cost price.

Not more than two such persons, however, may travel on these conditions on the same voyage.

8. The nature of the service of the wireless station on the ship (whether public or special service, etc.), and its duration (whether continuous, restricted or service without special fixed hours), also the number and qualification (1st class or 2nd class) of the wireless operators, will be set out by the Hungarian Minister of Commerce in the document granting permission for the installation.

9. The Hungarian Minister of Commerce reserves himself the right to suspend at any time the wireless service on the ship for an indefinite period or permanently or in respect of certain special classes of messages without divulging his reason for so doing or without rendering himself liable to the payment of an indemnity.

In the case of an order for mobilisation in the Hungarian Monarchy being issued or in the case of war the wireless service on the ship is to be suspended altogether unless the captain of the ship receives special instructions to the contrary from the Chief Post and Telegraph Administration.

The captain of the ship will be held personally responsible for the carrying out of this regulation.

In other respects in time of mobilisation or war the owner (or charterer) of the ship is bound to carry out the special orders to be issued for the occasion.

10. Wireless operators to be employed may only be Hungarian citizens with a blameless record who can speak and write the Magyar language thoroughly and have obtained a certificate of qualification as regards wireless operating from the examining committee appointed by the Hungarian Minister of Commerce for the purpose.

The individuals thus qualified are to take the oath of loyalty in the presence of the examining committee, such oath to include promises to attend to their duty and to keep all messages secret, the fact of their having taken the oath being recorded on their certificate of qualification.

The wireless operators on board are subject to the discipline on the ship, must each possess their service books, and are to be placed on the list of the crew.

The owner (or charterer) of the ship is only allowed to have such individuals trained for the wireless service who have been chosen by the Hungarian Chief Post and Telegraph Administration for such purpose from a preliminary list of candidates submitted to the Administration.

Every wireless operator whose certificate is cancelled by the Hungarian Post and Telegraph Administration is to be dismissed immediately.

The owner (or charterer) of the ship is bound to give immediate notice of any change in the personnel of wireless operators to the Chief Post and Telegraph Administration and to the Hungarian Naval Authorities.

11. Every wireless station established for public service may be used by the public for sending wireless messages against payment of the proper fees.

The tariff of fees for wireless messages is fixed by the Hungarian Minister of Commerce on the recommendation of the Company. These fees are retained by the owner of the wireless station on board.

12. Out of these fees received by the owner (or charterer) of the ship for wireless messages he is responsible for the portions due to the inland and foreign telegraph authorities for forwarding messages.

In administrative matters the owner (or charterer) of the ship, or the wireless station on board, may only communicate with foreign telegraph administrations or with the International Bureau at Berne of the Telegraph Association through the Hungarian Chief Post and Telegraph Administration.

13. In conformity with Rule 3 of the London Wireless Agreement the wireless station on board is bound to enter into communication with every wireless station ashore or established on any ships regardless of the system used by such stations for the purpose of exchanging messages, and in accordance with Rule 9 the wireless station on board is compelled to accept distress signals from any source whatever, to reply to these and to take the necessary steps.

Wireless stations established on ships are to pay particular attention to the working of stations on the coast. The wireless station on board is to be kept in perpetual and efficient working order in order to be able to keep up faultless communication with the coastal stations.

At the request of the coastal station the wireless station on board is bound to stop its message immediately.

14. The working of the wireless station on board and the accounting for the fees received by such station are to be governed by the London Wireless Agreement and the service regulations attached thereto, by the St. Petersburg Telegraph Agreement and the service regulations attached thereto, and also by any orders already issued or to be issued by the Hungarian Chief Post and Telegraph Administration.

The wireless station, or the shipowner (or charterer) respectively, is bound to conform with the legal enactments and orders issued with reference to matters relating to the telegraph, telephone and electric signals.

During a stay in foreign ports the wireless station on board is bound to conform with any special rules which may be in force in the country of its sojourn besides those prescribed by the International Wireless Agreement and the regulations attached thereto.

It is the duty of the shipowner (or charterer) to make himself acquainted with these.

15. As an acknowledgment of the sovereignty of the State and in order to defray expenses incurred in the ordinary control of the wireless station on board, the owner (or charterer) of the ship is bound to pay on the dates named, and at the receiving offices named in the document granting permission for the establishment of the wireless station, twenty (20) crowns per station per annum.

Should it become necessary to institute an inquiry owing to any neglect or fault on the part of the owner (or charterer) of the ship or one of his employees and should the inquiry establish any neglect or fault on the part of the owner (or charterer) or one of his employees, the owner (or charterer) will be bound to indemnify the Treasury for all expenses incurred in connection with such enquiry.

16. In every case of neglect or fault in or about the wireless service the Hungarian Chief Post and Telegraph Administration may mulct the owner (or charterer) of the ship in a penalty not exceeding 100 crowns providing such acts of neglect or fault do not constitute a misdemeanour or crime.

17. If after repeated warnings the wireless station on board should not do its duty, or if the working of the station should militate against public interests, the Hungarian

Minister of Commerce is empowered to inflict a heavier penalty of 100 to 1,000 crowns or to issue orders to have the working of the wireless station entrusted to an individual appointed by the Minister at the expense and responsibility of the shipping undertaking, and at the same time the Minister is to have power to have all faults made good in the apparatus and have all the necessary alterations made in the apparatus at the expense of the owner (or charterer) of the ship, or as an alternative to suspend or cancel the permit for the wireless station on board.

18. The permit for the establishment and working of a wireless station on board cannot be granted for a period exceeding 20 years.

At the expiration of the period mentioned in the document granting permission the whole installation with all its accessories (including furniture and fittings) and eventually also the installation for sending out distress signals are to be handed over to the Hungarian Post Office in full efficient and faultless working condition free of charge and without liability.

Should the Hungarian Post Office not wish to take charge of the working of such wireless station thus come into their possession, but to leave it further in the hands of the owner (or charterer) of the ship, the owner (or charterer) is bound to pay twenty (20) crowns per annum over and above the fee mentioned in Clause 15 in acknowledgment of the right of ownership of the installation thus acquired by the State.

A permit given for the establishment of a wireless station on a ship is automatically cancelled by the putting out of commission of the ship and the owner (or charterer) of the ship is obliged to give notice of this to the Hungarian Chief Post and Telegraph Administration. Should it be desired to transfer the wireless installation to another ship a fresh permit for so doing will be required.

19. Moreover, the Hungarian Minister of Commerce has full power to cancel temporarily or permanently the permit for the working of a wireless station at any time even before the expiry of the period for which such permit has been granted and to cancel it without assigning any reason for his decision and to take over the working of the installation or to have it dismantled.

In the case of the working of the installation being taken over temporarily by the Ministry, the owner (or charterer) of the ship is bound to hand over for use free of charge and without any indemnity the whole of the installation with all the apparatus, fittings and stores for working same, also the cabin and locality in which the installation is housed, together with the sleeping cabins of the wireless operators; also to supply free of cost the power required for working the installation and supply the food, render all medical service and provide attendance and other necessities required by the operators. As against this, however, all fees paid for wireless messages will be handed over to the owner (or charterer) of the ship.

The terms of the final taking over of the installation are or will be specified in the permit or in the special order issued for the purpose.

Before the installation is taken over finally under the ordinary conditions six months, previous notice will be given, but the Hungarian Minister of Commerce reserves himself the right to shorten the period if public interests should necessitate this step or even to take over the installation at any time without any previous notice whatever.

20. Should, in the unchallengable opinion of the Hungarian Minister of Commerce, public interests require it, the Hungarian Chief Post and Telegraph Administration may—through the courts of law and without incurring any liability in respect of claims for indemnity—issue orders for any vessel being fitted with wireless installation at the expense of the Treasury to have the service maintained and to have the installation dismantled when its use is no longer required by public interests and to arrange for certain compensation being arranged in connection therewith to the owner (or charterer) of the vessel.

21. The Hungarian Minister of Commerce reserves himself the right to grant exemptions from the above regulations from case to case in conformity with practical requirements.

Hungarian Minister of Commerce.

N.....

V. 191.

SHIP LICENCE.

B SEC. 1.—The Minister grants a licence to install a public wireless service station on his ship named carrying passengers and to work such station during the period while the licence remains in force under the conditions specified below.

SEC. 2.—The person to whom the licence is granted is obliged to comply with the following:—

(a) With the provisions contained in Section XXXI of the Law of 1888 and with Decree No. 23445 issued in July, 1890, for carrying out this law, as well as with Decree No. 62574 issued on October 16th, 1913, for establishing wireless stations on Hungarian passenger ships.

(b) With the provisions of any law to be enacted in future as well as of any ministerial decree or order already issued or to be issued in future by the Hungarian Post Office with the same object in view.

(c) With the orders contained in the International Wireless Agreement and its service regulations.

(d) With the conditions laid down in the present licence.

SEC. 3.—The grantee is obliged to establish the installation on board in accordance with the "Telefunken" system in a manner complying in every respect with the requirements laid down in the Wireless Service Regulations, Rule III, sub-sections 1 and 2, Rule VII, sub-section 2 and Rule VIII.

The normal distance over which the installation is to be able to exchange messages is to be at least 200 sea miles by day and at least 300 miles by night.

The normal wavelength of the installation is fixed by the Minister at 600 metres with the reservation laid down in Rules III and XXXV of the International Wireless Service Regulations.

SEC. 4.—The holder of this licence is obliged to install besides the ordinary service installation on board an auxiliary installation in conformity with Rule XI of the International Wireless Service Regulations.

SEC. 5.—The holder of this licence undertakes to maintain permanently the two installations mentioned in sections 3 and 4 in good serviceable working condition and to introduce all improvements in accordance with the progress made by the science of wireless telegraphy.

The Minister reserves himself the right to compel the holder of this licence to adopt all new inventions of wireless practice materially enhancing the reliability and speed of exchanging messages.

All machinery, apparatus and materials to be used in fitting up the installation on board are to be obtained inland as far as possible.

Machinery, materials and apparatus of this kind may only be obtained from abroad with the special sanction of the Hungarian Minister of Commerce.

SEC. 6.—The holder of this licence has no right to alter the system of the wireless installation on board mentioned in Section 3. Generally speaking the Minister's preliminary consent must be obtained for any alteration whatever in the installation as described in the technical description or in the diagram of connections both forming a complementary part of the present licence.

SEC. 7.—The holder of this licence and his employee in handling the wireless apparatus and maintaining the wireless service must act in conformity with the International Wireless Agreement and the Service Regulations attached thereto with the rate of telegraph fees and also with Parts I and II of the telegraph service rules and orders issued by the Chief Post and Telegraph Administration.

SEC. 8.—The Minister fixes the call signal of the station in the H.A.B. group of letters, its character is to be a "PG station for public correspondence" in conformity with sub-section 4 of Rule V of the Wireless Service Regulations. As regards hours of service the wireless station is to be classed in the second category—i.e., stations with restricted hours of service in accordance with the provisions of Rule XIII, sub-section 3 of the Wireless Service Regulations.

The official hours are to be from 8 a.m. to 8 p.m.

In accordance with Rule XIII sub-section 3 of the International Wireless Service Regulations—during the periods of sailing over and above the official hours named—operators must be at their posts ready to receive messages and stay there permanently during the first ten minutes of every hour.

SEC. 9.—In conformity with the office hours fixed in section 8 the holder of this licence undertakes to employ at least one first-class operator for attending to the service of the wireless station on board in accordance with Rule X sub-section 2 and the Wireless Service Regulations.

SEC. 10.—This operator, like all other wireless employees, must be a Hungarian citizen of blameless character who is able to write and speak the Magyar language perfectly and is the holder of a certificate of qualification for wireless operating from an examining body appointed for the purpose by the Hungarian Minister of Commerce.

The qualified individuals must take the oath of loyalty in the presence of the examining body, such oath to include promises of due attendance to their duties and to keep all messages secret, the fact of having taken this oath is to be testified in their certificate of qualification.

The employees in the service of the wireless station on board are subject to the discipline of the ship, they must be provided with service books of the ship and enrolled on the register of the crew.

As regards the wireless service these employees are subject also to the Chief Post

and Telegraph Administration and must comply with the directions issued for the proper performance of the service.

The owner (charterer) of the ship may only train such individuals for the wireless service whose training is permitted by the Hungarian Chief Post and Telegraph Administration after preliminary notice of such intended training has been given to the Administration.

Every wireless employee whose certificate is withdrawn by the Hungarian Chief Post and Telegraph Administration must be dismissed immediately.

The owner (or charterer) of the ship must give immediate notice of any change in the personnel of the wireless staff to the Chief Post and Telegraph Administration and also to the Hungarian Naval Authorities.

In accordance with Rule X sub-section 4 of the Wireless Service Regulations "the service of the wireless station on board is under the chief supervision of the captain of the ship." Hence the holder of this licence must order the captain of the ship to take the oath of loyalty and for the preservation of the secret of messages, before a representative of the Hungarian Post Office.

SEC. 11.—The wireless station is intended for public correspondence and may therefore be used by anybody for sending messages against payment of the prescribed fees and observance of the rules laid down for the telegraph service.

On the other hand, in accordance with Rule 3 of the International Wireless Agreement the wireless station on board must exchange wireless messages with any and every other such station on shore or afloat—irrespective of the system used by such stations for receiving or sending wireless messages.

The operators of the wireless station on board must refuse to accept any message which, if transmitted to any part of the territory of Hungary, may endanger the safety of the Hungarian State, or the contents of which may form a breach of the country's laws or offend against public order or morality.

Should the person handing in the message still insist on its transmission the captain of the ship is to be appealed to, whose decision in the matter is to be considered final.

SEC. 12.—The fee for transmitting a wireless message from the ship is fixed at 40 fillers per rateable word with a minimum fee of 4 crowns per message.

The Minister, however, reserves himself the right to modify this rate of fees at any time even during the duration of this licence or to fix a new tariff for messages sent.

SEC. 13.—The fees referred to in the previous section may be retained by the holder of this licence.

Messages which at telegraph stations of the State are accepted for free transmission or are transmitted on the credit system must be accepted and transmitted by the holder of this licence on the same terms.

SEC. 14.—In dealing with telegrams and preparing accounts the wireless station on board must only use dating stamps, printed forms and books that are prescribed for use and are issued for this purpose by the Hungarian Post who will supply them to the holder of this licence at cost price on his written application to the Chief Post and Telegraph Administration.

The holder of this licence is obliged under all circumstances to keep within easy reach a copy of each of the following service books for the use of the wireless station staff on board—the International Telegraph Agreement with

the Service Regulations pertaining thereto, the International Wireless Agreement with the Service Regulations pertaining thereto, the Nomenclature Officielle des Bureaux Télégraphiques, the Nomenclature Officielle des Stations Radiotélégraphiques, the Liste Alphabétique des Indicateurs d'Appel the book, of telegraph rates and Parts I and II of the Telegraph Service Regulations, the book of telegraph fees issued for Hungarian wireless stations on ships, and also a copy of the Post and Telegraph Instructions. The holder of this licence must also take care that all these books are corrected and kept up to date by the wireless staff in conformity with the additions and corrections periodically issued by the International Telegraph Bureau and in the collection of Postal and Telegraph Regulations.

SEC. 15.—The holder of this licence is fully responsible financially for all claims of every kind raised on any legitimate grounds against the Hungarian Post Office by anybody for the return of fees paid or indemnification in cases arising from the service of the wireless station on board his ship.

The holder of this licence is fully responsible financially for all telegraph fees of every kind payable under International agreements in accordance with telegraph tariffs arising from the telegraph service of the wireless station on his ship.

These fees—at the financial responsibility of the holder of this licence—are collected in cash by the staff of the wireless station on his ship who are bound to keep and render correct accounts and also supply a list of all the wireless messages received, sent or relayed by the station. The Chief Post and Telegraph Administration issues proper forms for making out such accounts and lists with the necessary instructions for dealing with these forms.

The holder of this licence or the manager of the wireless station in his place—in accordance with Rule XL of the International Wireless Service Regulations—must once a month or in any case within eight days of the ship's return to port from every voyage send at the expense of the holder of this licence to the Section III of the Audit Department of the Ministry of Commerce the following papers and documents carefully arranged and packed: the originals of all wireless messages, all records of messages transmitted, all receipts for delivery of wireless messages received and all documents and accounts in connection therewith.

Prior to this, however, the holder of this licence or the manager of the wireless station in his place must prepare an account of all fees received in connection with the working of the wireless station on board and after deducting the fees due to the holder of this licence or to the wireless station on board he must pay in the remaining balance at the Hungarian Post and Telegraph Office No. 1 duly receipting on the account the sum retained by the station on the ship of the holder of this licence.

The holder of this licence or the manager of the wireless station on board respectively may only communicate with foreign telegraph authorities or with the International Bureau of the Telegraph Association at Bern through the medium of the Hungarian Chief Post and Telegraph Administration.

SEC. 16.—In home ports the wireless station may not transmit telegrams unless specially authorised to do so by the Chief Post and Telegraph Administration.

When visiting foreign parts, any special regulations in force in the country of sojourn must also be respected in addition to the regulations of the International Wireless Agreement and the Service Rules prescribed therein.

It is the duty of the owner (or charterer) to make himself acquainted with these.

SEC. 17.—The Hungarian Chief Post and Telegraph Administration may at any time have the wireless station examined by their inspectors and its service checked.

The owner (or charterer) of the ship undertakes to afford means to the inspectors of the Hungarian Chief Post and Telegraph Administration, as well as to officers of the Navy, through the mediation of the Hungarian Chief Post and Telegraph Administration to make themselves thoroughly acquainted in every detail with the handling of the wireless apparatus and to acquire the necessary practice therein.

The owner (or charterer) of the ship must not consent to any stipulation on the part of the supplier of the wireless apparatus that the arrangement of the apparatus or any part thereof should be kept secret and not be shown to the inspectors of the Hungarian Post and Telegraph Administration or to the officers of the Navy.

The owner (or charterer) of the ship undertakes to carry the inspectors and naval officers thus appointed for the study of the apparatus and training in its manipulation free of charge in a class of the ship corresponding to their rank, also to find them, free of charge, cabin accommodation and to make it possible for them to pay for their board at cost price.

Two such persons, however, may only travel on the ship on the same voyage.

SEC. 18.—As an acknowledgment of the right reserved to the State and to defray the costs incurred in the regular control of the wireless station on board, the holder of this licence undertakes to pay the sum of twenty (20) crowns to the Post and Telegraph Office No. 1 within the first half of January every year.

Should an inquiry become necessary owing to any alleged neglect or fault on the part of the owner (or charterer) of the ship or one of his employees, and should such enquiry prove that the holder of this licence or his employee is at fault, the holder of this licence would be obliged to refund to the Treasury the whole of the costs arising from such enquiry.

SEC. 19.—The Hungarian Chief Post and Telegraph Administration has the power to mulct the holder of this licence in a penalty not exceeding 100 crowns for any neglect or fault in the wireless service provided such omission or commission does not form an act of misdemeanour or a crime. If the wireless station on board should not attend to its duties after repeated warnings, or should the service of the station clash with the public interests, the Hungarian Minister of Commerce shall have the power to inflict eventually a higher penalty of from 100 to 1,000 crowns or to make arrangements to have the wireless service of the station performed by a delegate of the Minister specially appointed for the purpose at the expense and responsibility of the shipping undertaking, and to have any apparent shortcomings in the arrangement of the wireless apparatus put right and any required alterations made at the expense of the holder of this licence, or as an alternative the Minister may suspend or cancel the licence for the working of the wireless apparatus.

SEC. 20.—The period during which the present licence will remain in force is ten (10) consecutive years counting from the date of the licence.

Should the holder of this licence not install the wireless apparatus within a year counted from the date of the present permit, this permit will be cancelled and the holder of the licence will have to return it for cancellation to the Minister.

SEC. 21.—In accordance with the provisions of Section XXI sub-section 3 of the Law of 1888 and in conformity with the decree issued by the Minister of Commerce under No. 62574/1913 in the matter of establishing wireless stations on sea-going passenger ships, the whole of the wireless installation with all its accessories (including furniture, fittings), as well as the installation for sending out distress signals, is to be handed over to the Hungarian Post Office in perfect working order free of cost and without any claims at the expiry of the period specified in the present licence.

Should the Hungarian Post not wish to undertake themselves the service of the station thus handed over to them but to leave its further working in the hands of the holder of this licence, the owner (or charterer) of the ship undertakes to make an annual payment of twenty (20) crowns in acknowledgment of the proprietary right over the installation thus acquired by the State over and above the payment specified in section 15 payment of both sums to be made simultaneously.

Should a ship be put out of commission the licence for the maintenance and working of the wireless station thereon becomes null and void and the holder of the licence shall give the Hungarian Chief Post and Telegraph Administration due notice of the fact. Should it be desired to transfer the wireless installation and re-erect it on another ship, this can only be effected under a new licence.

SEC. 22.—The Minister reserves himself the right to take possession temporarily or permanently, on behalf of the State, of the wireless station at any time even before the expiry of the present licence without giving any explanation whatever for taking such a step.

Should the installation be taken over temporarily the holder of this licence undertakes to hand over for use free of charge the whole of the apparatus with all accessories, fittings and stores for working it as well as the office wherein it is housed and the cabins for the accommodation of the operators without any claim for indemnity, also to supply free of charge the power required for working the installation, also to provide free of charge all necessities (board, medical assistance and servants, etc.) required by the operators. As against all these services all fees collected for wireless messages are to be handed over in this instance also to the holder of this licence.

Under normal conditions six months' previous notice will be given if the installation is to be taken over permanently, but the Hungarian Minister of Commerce reserves himself the right to shorten the period of this notice or to take possession of the station at any time without any notice at all, should public interest call for such a step.

Should the working of the installation be taken over by the State permanently before the expiry of this licence, the Hungarian Post Office will indemnify the holder of this licence for the technical parts of the wireless apparatus by paying him the cost as per invoice or other evidence to be produced by him less ten (10)

per cent. for every year during which the installation has been in use. The balance thus remaining will be paid to him by the Post and Telegraph Administration at Budapest.

Beyond this indemnity to be paid to him the holder of the licence shall not be able to sue in any court for any claim for loss of profit or for the payment of any other indemnity under any other pretext whatever.

SEC. 23.—The Minister reserves himself the right to suspend at any time the service of the wireless station for an indefinite period, or permanently, or for messages of a certain kind without having to assign any reason for such an order and without incurring any liability for damages caused by the suspension.

In case of an order being issued for mobilisation in Hungary, and in time of war, the wireless station on board is to be closed down altogether unless the captain receives instructions to the contrary from the Hungarian Chief Post and Telegraph Administration.

The captain will be held personally responsible for the compliance with this direction.

In other respects the holder of this licence will have to carry out all special orders to be issued in times of an eventual mobilisation or war.

SEC. 24.—This licence may only be transferred to another person with the Minister's special consent to be applied for in advance.

SEC. 25.—Should any difference of opinion arise between the State and the holder of this licence as to the correct interpretation of any of the stipulations of the present licence the matter or matters at issue shall not be referred to any Court of Justice but shall be settled by the Minister of Commerce in the usual official way, adopted by the Public Administration.

SEC. 26.—Every copy of the present licence issued officially is subject to a fixed stamp duty amounting to two crowns.

Budapest, 19 .

By the Order of the Minister,
Chief Director of Posts and Telegraphs.

CERTIFICATE.

C FOR THE SHIP STATION on board the Hungarian vessel

The general administration of Posts and Telegraphs of Hungary attests that the ship station on board the Hungarian vessel was installed on the basis of the licence of the Hungarian Government and that the installation of the ship station complies with the conditions prescribed by the service regulations annexed to the International Radiotelegraph Convention.

The ship station is classed in the category from the point of view of its obligations as to hours of service.

Normal range in nautical miles :

Day

Night

Budapest, the

General Administration of Posts and Telegraphs of Hungary.

OPERATOR'S CERTIFICATE.

D The Commission, delegated by the Hungarian Minister of Commerce, has submitted Mr.

born at

on the

to an examination of the radiotelegraph service and tested his professional ability as regards :

(a) The adjustment of apparatus and knowledge of its working.

(b) The speed of—

Transmission

.....words per minute.

Reception by sound

.....words per minutes.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph communications.

In testimony whereof the Ministry of Commerce of Hungary has, by virtue of Article X of the International Radiotelegraph Convention issued this Class Certificate to Mr. who at the conclusion of the examination took the oath of secrecy of correspondence.

Made at

19. .

, the

FORM OF LICENCE FOR PRIVATE RECEIVING STATIONS.

E 1. Whereas the erection, equipment and operation of telegraph, telephone and other electrical signalling installations are a State monopoly, the Ministry of Commerce, in accordance with the Act XXXI of 1888, and under the regulations issued on 18th July, 1890, licences

to install a wireless receiver exclusively for instructional scientific research and experimental purposes in conformity with the diagram and technical description attached to this licence, and to operate it during the period covered by this present document upon the conditions specified below :—

2. The licensee must conform strictly—

(a) To the Act XXXI of 1888, and to Regulation No. 23445/V issued on 15th July, 1892.

(b) To the conditions of this licence.

(c) To all other valid laws, regulations, decrees and orders already in force, or which may be issued during the term of this licence.

3. The receiver licenced must be installed in strict conformity with the diagrams approved and the description attached, and at the place specified in this document. It is necessary to obtain the sanction of the Ministry of Commerce before making any alteration in this installation which may affect its reception of signals.

4. The licensee must purchase all materials, apparatus and other accessories necessary for installing and operating the station in this country. If this be found impossible the Royal Hungarian Ministry of Commerce may grant a special exception to this rule.

5. The licensee must use his installation solely for educational, scientific research, and experimental purposes. He is not allowed to communicate signals to a third party, nor to use his station for conducting his own correspondence. Nor may he allow any unauthorised persons to use his installation.

6. This licence is available for ten years reckoned from the date of this document.

7. For an extension of this licence the holder must apply during the first part of the tenth year. In the event of an extension of the licence not being granted before the expiration of the time specified therein, the licensee must dismantle and remove his station within 14 days from the expiration of the licence. In the event of his neglecting to do so the regulation under Act XXXI of 1888, section 11, will be enforced.

8. The licence is only transferable to a third party by special permission from the Ministry of Commerce.

9. The Ministry of Commerce reserves the right to inspect the equipment and operation of the station at any time. The persons appointed by the Minister for such inspection and examination are authorised to inspect the licensee's station at any time they may deem fit, and the licensee is bound to afford every facility for such inspection, and to give such information as may be required to enable the inspectors to become familiar with the working of the equipment. The licensee must not withhold from the officials of the Ministry information regarding the apparatus, even though the suppliers may have stipulated that portions of the installation must be kept secret.

10. The Ministry of Commerce may, in the event of the licensee neglecting his duties—if he has not thereby infringed any law—impose a fine not exceeding 4,000 crowns. The licensee must pay this fine within 15 days at the office designated by the Ministry of Commerce.

11. The Ministry of Commerce has the right to prohibit the use of the licensed installation either partially or entirely for a long or short period, and to make its use impossible. No legal action for compensation can be taken with regard to such action by the Ministry.

12. The Ministry of Commerce is entitled to declare this licence withdrawn and cancelled at any time should the licensee neglect any of the regulations specified in this present document. The withdrawal of the licence establishes no claim for compensation nor any liability on the part of the State.

13. Upon the expiration of this licence, either by abandonment or withdrawal, the licensee must remove the installation at his own expense within 14 days from receipt of the notice. Should the licensee neglect to obey the notice within the time specified the Directorate of the Royal Hungarian Posts and Telegraphs will cause the installation to be removed at the expense of the licensee. The Ministry of Commerce reserves the right to take possession of the whole or a part of the installation on the expiration of the licence from any cause and upon payment of a fair compensation.

14. In the event of mobilisation or of war—unless otherwise decreed by the Ministry of Commerce—the station must be put entirely out of working order. The licensee is responsible for carrying out this regulation, and the Ministry of Commerce is entitled to enforce the observance thereof, and if necessary to make the reception of traffic impossible by the removal or destruction of parts of the apparatus.

15. In the event of strikes, emergencies, etc., the Ministry of Commerce may make use of the station for as long as is necessary for the exclusive use of the Royal Hungarian Post or for military purposes, and may put the management into the hands of officials of the Post Office or of the Army.

16. The licensee is allowed to employ only Hungarian citizens for operating the licensed station. The licensee must furnish the Royal Hungarian Post and Telegraph Directorate at , without any delays with the names and addresses of such person, and with any change that may occur.

17. The licensee and those authorised to operate the station must observe strict secrecy regarding messages received, especially the contents of State or military telegrams, and must make oath, before the Directorate of Posts and Telegraphs, and sign a written undertaking to this effect.

18. As a recognition of the State Monopoly Rights, and as a contribution towards the expense of superintendence, the licensee must pay a fee of 1,000 crowns on the 1st January in every year to the Directorate of the Royal Hungarian Posts and Telegraphs at

19. If in consequence of a fault or omission on the part of the licensee or of his employees a supplementary inspection is necessary in addition to the regular inspection, the whole expense incurred must be borne by the licensee.

20. Any points of controversy arising between the State and the licensee regarding the interpretation of the conditions of this licence are to be decided by the Royal Hungarian Ministry of Commerce according to the Government regulations and without recourse to legal action.

21. For every copy of this licence a stamp fee of 10 crowns is charged.

Budapest.....192

ICELAND

(See Maps 2 and 15)

THE State has a monopoly in the erection and working of wireless stations, but private persons or companies may be permitted to do both under a licence from the Telegraph Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Klemens, Jonsson	Minister of Public Works	Reykjavik
Mr. O. Forberg	Director-General of Telegraphs	Reykjavik
Mr. Frb. Adalsteinnsson	Superintendent of Wireless Station and School	Reykjavik

The following legislative enactments govern wireless in Iceland :—

A—Act of November 14, 1917.

B—Regulations under the above Act.

ACT OF NOVEMBER 14TH, 1917, CONCERNING THE WORKING OF WIRELESS TELEGRAPH STATIONS IN ICELAND.

I.

A The State has a monopoly in the erection and working of wireless stations on Icelandic soil and within the territorial waters of Iceland.

II.

Within the territorial waters of Iceland, the wireless stations of foreign ships may only be in use in conformity with regulations drawn up by the Ministry of Iceland. The Ministry can prohibit all wireless communication within the territorial waters of Iceland, and take such precautions as may be necessary to ensure the observance of this prohibition.

III.

On board of Icelandic ships which do not belong to the Government, whether they are within or without the territorial waters of Iceland, wireless stations may only be erected and worked with the permission of the Ministry. If the stipulations accompanying this permission as regards the equipment and working of the station are not complied with, the Ministry can withdraw it. Applications for permission to work wireless stations that are in operation when this Act comes into force must be sent to the Ministry not later than eight weeks from the date of this Act. The Ministry will then decide how their future working is to be carried on.

IV.

On Icelandic soil, and within the territorial waters of Iceland, wireless stations, or other means of wireless communication, can only be installed and worked with the consent of the Ministry, and in conformity with the stipulations made by it.

V.

The Regulations contained in the fifteenth paragraph of the Telegraph Act of October 20th, 1905, imposing secrecy upon those engaged in the telegraph service, are equally applicable to wireless operators. Paragraph 16 of the same Act, regarding the same obligation of those engaged in private telegraph service, is also valid as regards wireless telegraph operators on board of ships.

VI.

The violation of this law, or of the Regulations which the Ministry are hereby empowered to make, shall be punished with fines, or with imprisonment for a term not exceeding six months, provided the violation does not involve a more serious punishment. Further, all apparatus illegally installed or worked shall be confiscated. Lawsuits arising from violations of this law, or the corresponding Regulations of the Ministry, shall be tried in public police courts.

B WIRELESS TELEGRAPHY AND TELEPHONY REGULATIONS.

I.

In the present Regulations:

(a) *Wireless Station* means apparatus or other means of conveying signals to a distant point without any intermediate conductor.

(b) *Wireless Operator* means a person employed in the operating of all sorts of apparatus for wireless telecommunication.

(c) *Ministry* means the Ministry of Iceland.

(d) *Wireless apparatus* means apparatus used for transmission and reception of intelligence between distant points, without any intervening conductor.

I.—ERECTION OF WIRELESS STATIONS.

II.

On Icelandic soil, or within the territorial waters of Iceland, or on ships registered in Iceland, a wireless station must not be erected or worked without a special permit of the Ministry, who will issue a licence for such station. This licence, or a certified copy of it, must always be kept at the station named therein. If the stipulations contained in this licence are not complied with, it may be withdrawn and the station dismantled.

III.

Applications for a licence to erect and work a wireless station must be sent to the Director-General of Telegraphs.

The installation of wireless stations on board ships must comply with the stipulations of Paragraph VII of the International Regulations of Wireless Telegraphy.

A wireless station must not be opened for correspondence before the Director-General of Telegraphs has declared the equipment complies with the stipulations contained in the licence.

2.—INSTALLATION AND OPERATION OF PRIVATE SHIP STATIONS.

IV.

The wireless apparatus of a ship station must always be maintained in strict accordance with the stipulations of the licence.

V.

The Director-General of Telegraphs fixes the hours of service for each coast station.

Ship stations are, as regards hours of service, divided into three classes:

1. Stations permanently open.
2. Stations with limited hours of service.
3. Stations with no fixed hours of service.

During navigation a constant aural watch must be kept at stations of the first class. On stations of the second class watch must be kept during the hours of service, and also during the first ten minutes of each hour. At stations belonging to the third class no regular watch need be kept.

VI.

All ship stations must be so equipped as to permit both transmission and reception with 300 and 600 metre wavelengths; 600 metres is the normal wavelength of all ship stations.

An exception to this rule may be made in the case of small vessels, where it is difficult to produce a wavelength of 600 metres, when permission may be given to use 300 metre wavelengths for transmission, but every station must be able to receive wavelengths of 600 metres.

First and second class ship stations must be fitted with an auxiliary transmitting set provided with an independent power supply able to work for at least six hours continuously. This set must be fixed in as safe a position as possible, and must have a minimum range of eighty miles for third class stations and fifty miles for second-class stations.

On ships where the main installation is such as to fulfil the conditions laid down for the auxiliary set, the latter is not required.

VII.

Ship stations should be operated by either one or two wireless operators licensed by the Director-General of Telegraphs.

Wireless operators holding certificates issued by foreign administrations may be permitted to operate ship stations, but a separate permit must be obtained for each voyage.

The certificate states:—

(a) That the holder understands the wireless apparatus and how to operate it.

(b) That the holder is able to both transmit and to receive Morse signals at a speed of not less than

(1) Twenty words a minute in the case of first-grade operators, and

(2) Twelve words a minute in the case of second-grade operators.

(c) That the holder possesses an adequate knowledge of the Regulations affecting wireless telegraphy.

Furthermore, the certificate contains the holder's pledge of secrecy, whereby he is subject to the same law as telegraph operators of the telegraph administration, and the same penalties for violation.

Second-grade wireless operators are permitted to operate ship stations which are only for the ship's own use or that of the crew. Furthermore, they are entitled to operate other stations having at least one first-grade operator.

First-class ship stations are bound to be operated by at least two first-grade wireless operators.

Wireless operator's certificates must always be kept in the wireless cabin, where they can be seen by the radio inspectors of the telegraph department.

VIII.

So far as it is possible all ships stations are bound to exchange traffic with other stations, without regard to the wireless telegraph system of the station concerned. The exchange of traffic between ships must be so arranged as to interfere as little as possible with that of the coast stations, which are generally given priority in public correspondence.

As a general rule, the wording of every station must be so arranged as to cause the least possible disturbance in the traffic of other stations. All unnecessary transmission of signs or words is strictly forbidden. Experiments and tests are only permitted in so far as they do not interfere with other stations. In such cases as little transmitting energy as possible and none of the ordinary wavelengths should be used.

In an Icelandic port the wireless apparatus of a ship must not be made use of except in case of:—

(a) The ship being in distress.

(b) The ship being in communication with a ship in distress.

(c) The ship being in a port where there is no telegraph or telephone station.

(d) The ship being, for some reason or other, unable to communicate with the shore otherwise than by wireless.

As regards (c) and (d) the permission of the nearest shore station within the ship's range must be obtained.

IX.

Whenever it is considered necessary, the telegraph department arranges an inspection of each ship's station by persons appointed therefor by the Director-General of Telegraphs.

All their orders and arrangements relating to the maintenance and operation of the wireless apparatus must be closely followed. Inspectors are required to supply the Director-General with a report of the inspection of each station.

3.—HANDLING OF RADIOTELEGRAMS.

X.

All wireless stations, except those intended for a special limited correspondence (see Paragraph XI), are required to accept public correspondence.

Messages are divided into three classes:—

1. Government messages.

2. Service messages.

3. Public correspondence.

The handling of these messages on the land lines will be in accordance with the domestic and international regulations governing the telegraph service. The handling of radiotelegrams between wireless stations will be carried out in accordance with Paragraphs XIV-XV, XIX-XL, XLV-XLIX of the International Wireless Telegraph Regulations.

XI.

Ship stations may be utilised for:—

(a) General public correspondence.

(b) Limited public correspondence—*e.g.*, light ships, cable ships, etc.

(c) Private correspondence (with special ships and fishing companies).

In general public correspondence the following special radiotelegrams may be accepted:—

1. Telegrams with reply prepaid.

2. Telegrams to be repeated.

3. Telegrams to be delivered by mail.

4. Telegrams with multiple addresses.

5. Telegrams with certificate of delivery.

This certificate is only issued as regards delivery from the wire to the nearest wireless station.

6. Paid service messages.

7. Express telegrams. These are, however, only transmitted as such along the ordinary land lines.

All stations are bound to give precedence to inquiries from ships in distress.

Ship stations have no responsibility as regards the exchange of radiotelegrams.

Ship stations that are open for general public correspondence will, against payment, be supplied with all printed forms, journals, etc., by the telegraph department; these stations are bound to be governed by all instructions of the Director-General of Telegraphs as regards operation of the apparatus and handling of the traffic.

XII.

The complete charge for a radiotelegram includes:—

1. The wireless charges:—

(a) The shore fees (belonging to the shore station).

(b) The ship fees (belonging to the ship station).

(c) The transit fees (belonging to an intermediate land or ship station that may be required to handle the message).

2. The wire charges.

The shore charges in this country shall be 40 cents a word, and not less than 4 frs. for each message.

The ship fees are fixed by the shipowner with the approval of the Director-General. They must not exceed 40 cents, and the minimum charges must not be more than that for a ten-words message. Service messages, *re* wireless traffic, that has only

passed between wireless stations, are not free of charge on the land lines. Press telegrams at half rate are not accepted.

XIII.

The entire charge for handling a radiotelegram from sender to addressee is to be charged to the sender. It is not permitted to charge more than stated in the tariff books.

XIV.

Every shipowner is liable for all charges collected on board his ships.

XV.

Each ship station is bound to send, once monthly, all original radiotelegrams, with relative vouchers, to the Director-General of Telegraphs.

XVI.

Reimbursement of charges, and accounts with the Telegraph Department, are to be governed by the Paragraphs XLI and XLIII of the International Radiotelegraph Service Regulations.

4.—EXPERIMENTAL AND AMATEUR STATIONS.

XVII.

Those wishing to erect an experimental or amateur wireless station must send an application for permission therefor to the Director-General of Telegraphs.

The applicant must prove his ability to transmit and receive at not less than ten words a minute in the Continental Morse code, and that he possesses an elementary knowledge of the science of wireless telegraphy. The application must be accompanied by drawings, and an accurate specification of the

station to be erected. Such stations will not be permitted to radiate waves of greater length than 200 metres.

In the event of a licence being granted to such stations the licensee must sign a declaration of secrecy.

5.—OTHER STIPULATIONS.

XVIII.

The stipulations of Paragraph VIII, *re* use of wireless apparatus in ports, are also valid as regards foreign vessels.

XIX.

The Ministry may prohibit all radiotelegraphic communication within the territorial waters of Iceland, by both Icelandic and foreign vessels, and may make the necessary arrangements to enforce this prohibition.

The Ministry can, furthermore, exercise a censorship over all such radiotelegraphic traffic, and stop any radiotelegram that is considered to be harmful to the safety of the State.

XX.

Violations of these Regulations are liable to a fine not exceeding 10,000 krónur, or imprisonment for a term not exceeding six months, if the transgression does not involve a more severe punishment. Illegally erected or operated wireless apparatus will be confiscated.

Lawsuits arising from the violation of these Regulations will be tried in public police courts.

XXI.

These Regulations shall come into force immediately.

Date of Issue : May 17th 1918.

IRELAND.

(See Maps 2 and 6)

UNDER the Government of Ireland Act, 1920, a separate Parliament was established in June, 1921, for the six Counties of Northern Ireland. The remaining twenty-six Counties form the Irish Free State, legally established in December, 1922.

NORTHERN IRELAND (ULSTER).

The control of Wireless Telegraphy and Telephony is administered from London, and any licences granted will normally be subject to the same conditions as those granted in Great Britain. Applications for experimental licences should be made through the Ministry of Commerce, Belfast, and for Broadcast licences through the Ministry of Home Affairs, Belfast. The necessary forms of application for the latter licence can be obtained at any Head or Branch Post Office in Northern Ireland.

THE IRISH FREE STATE.

The laws and regulations governing wireless telegraphy and telephony are at present the same as those in Great Britain.

The control of wireless telegraphy and telephony is vested in the Postmaster-General, Dublin.

The radio stations at Valentia and Malin Head for public correspondence with ships are at present staffed and worked by the Irish Free State on behalf of the British Post Office. There are no Government, private or direction-finding stations.

The issue of licences for amateur or experimental stations has been suspended since July, 1922, but the granting of such licences will probably be soon resumed.

Negotiations are taking place for the establishment by private enterprise of a Broadcasting Station at Dublin for the supply of news, etc.

The terms on which the P.M.G. would be prepared to consider the granting of a licence for broadcasting in the Irish Free State would be :

1. That a broadcasting company should be formed, with a guaranteed capital of not less than £30,000, which would undertake to erect and open a broadcasting station in or near Dublin.

2. That the company should be open to any *bona fide* firm or person carrying on the business of manufacturing wireless apparatus in the Irish Free State on taking one or more shares in the company, and the Board of Directors should consist of seven members nominated by the constituent companies.

3. That the licence should be for five years, and be renewed thereafter at the pleasure of the P.M.G. Power would be reserved to terminate the licence at any time for failure to fulfil the conditions.

4. That the importation of wireless sets or component parts of sets should be confined to the company and its members.

FEES.

5. That the company would be at liberty to manufacture or sell wireless receiving apparatus, and would receive a share of the fee to be charged by the Post Office for and in accordance with the following scale :—

Ordinary licence, fee £1 10s. per year (company's share, 12s. 6d.); private constructor, fee £2 per year (company's share, 32s. 6d.) schools or institutions, fee £2 a year (company's share, 32s. 6d.).

Hotels, restaurants, public-houses, etc., fee £5 a year (company's share, £4 10s.).

Occasional licence, fee £1 each (company's share, 12s. 6d.); traders or dealers, fee £1 a year (company's share, £1); amusement purveyor's fee £1 per week (company's share, 90 per cent.).

ITALY

(See Maps 2 and 13.)

THE executive power of the State belongs exclusively to the Sovereign, working through responsible Ministers; whilst the legislative authority rests conjointly with the King and Parliament, the latter consisting of two Chambers.

CONTROL.

Wireless telegraph land stations in the Kingdom belong to the Government and are operated by the Ministry of the Navy (Department of Artillery and Armaments), the Ministry of Posts and Telegraphs and the Ministry of War. Each Ministry includes a special department for dealing with wireless telegraphy. No wireless societies or clubs have yet been established on a serious basis, but many are about to be formed.

ADMINISTRATION.

The current Rules and Regulations which we print below (and which cover the Italian Colonies) may be summarised in the following List. There are at present none relating to aviation nor for amateur or experimental transmitting stations except as provided under Articles 6, 7 and 8 of the Royal Decree No. 1067.

The Law No. 395 of 30th June, 1910, and Regulation No. 227 of 1st February, 1912 (copies of which appeared in the YEAR BOOK for 1923) are now obsolete, and replaced by Royal Decrees No. 1067 of 8th February, 1923, and No. 1262 of 5th June, 1923; and the Decree No. 1587, of 12th November, 1916 (which was also printed in the YEAR BOOK for 1923) is superseded by the Royal Decree No. 1786, of 5th December, 1920.

A—Royal Decree No. 2223, of 4th November, 1919, regarding Certificate in Radiotelegraphy.

B—Royal Decree No. 1786, of 5th December, 1919, regarding Ship Stations.

C—Decree of 23rd May, 1921, regarding Control of Radiotelegraphic Correspondence on board Ships.

D—Royal Decree No. 1067 of 8th February, 1923: Regulations for Wireless Telegraph Service.

E—Royal Decree No. 1262, of 5th June, 1923: Supplementary to No. 1067.

ROYAL DECREE No. 2223, OF 4TH NOVEMBER, 1919.

VITTORIO EMANUELE III.

A—By the grace of God and the will of the Nation, King of Italy.

Having seen the law of 30th June, 1910, No. 395, and the relative regulations approved by Royal Decree 1st February, 1912, No. 227;

Having seen the Royal Decree No. 1002 of 11th July, 1913, ratifying the International Radiotelegraphic Convention of London, 1912, and the acts thereto annexed;

Having seen the Royal Decree of 28th December, 1913, No. 1480, which extends to the radiotelegraph service in the Italian Kingdom the provisions of the above-mentioned Convention of London;

Having recognised the necessity of establishing—in harmony with the provisions of Article X of the Service Regulations annexed to the aforementioned Convention of London—opportune regulations for the issue of Government certificates to radiotelegraphists desirous of performing radiotelegraph service on board mercantile vessels;

On the proposal of the Minister Secretary of State for the Navy, in agreement with the Minister of Posts and Telegraphs;

WE HAVE DECREED AND WE DECREE:

ART. 1.—Certificates of competency to perform radiotelegraphic service on board commercial vessels, as contemplated in Article X of the Service Regulations annexed to the International Radiotelegraph Convention of London, will be issued by the School of Semaphorists and Radiotelegraphists of the Royal Navy at Spezia (Comando difesa militare marittima.)

2. At the aforementioned school shall be instituted and maintained up to date a general register of all the candidates examined, with particulars of the examination undergone by each candidate, and the result. The school shall also preserve in its archives a copy of the photograph of each candidate, furnished with all the particulars entered in the general register and also a personal description of the candidate.

The Ministry of Marine shall be empowered to authorise, when circumstances require and merely as an exceptional case, that candidates shall be examined at other branches of the Royal Navy, but the examination must always be conducted under the supervision of the officials of the Royal School of Semaphorists and Radiotelegraphists.

ART. 2.—Candidates shall be examined by a suitable commission composed of:

The Director of the aforementioned School or a superior officer of the Staff of the Royal Navy.

Two officers or officials of the Royal Navy who are specialists in radiotelegraphy.

The commission will assemble in the early days of each month.

ART. 3.—Candidates, in order to be admitted to the examinations, shall forward, in due time, an application on stamped paper to the value of two lire addressed to the "Direzione della regia scuola semaforisti e radiotelegrafisti Spezia," and such application must be accompanied by the following documents:

Certificate of study (not less than the "licenza elementare").

Authentic copy of birth certificate proving that the applicant has completed his eighteenth year but is not more than thirty years of age;

"Certificato di penalità" (police certificate of good conduct), the date of which must not be more than two months prior to the date of presentation of such document;

Certificate of good conduct and personal character issued by the Mayor of the Commune in which the applicant is resident, bearing the visé of the Prefect or Sub-Prefect;

Any certificates testifying to the applicant's knowledge of radiotelegraphy and foreign languages;

Certificate of Italian citizenship;

Certificate of entry in the lists of the military or naval levies and the certificates of service performed;

Two photographs;

Postal order for L.2.05, the fee for the certificate of radiotelegraphy. (This amount will be refunded to candidates failing to pass the examination.)

The candidate shall declare in the application whether he has undergone previous examination, and if so the date and place of such examination.

N.B.—A man presenting the certificate of "esito di leva" or the extract of the "matricola della gente di mare" will not be required to present a certificate of Italian citizenship.

All documents shall be presented on paper stamped to the prescribed amount, unless the applicant is able to show, by authentic document, that he is in a state of poverty. The application, however, must always be written on stamped paper.

ART. 4.—Applicants who are admitted to the examinations after having presented the prescribed application duly documented will be notified by the School authorities as to the day on which they are to present themselves to undergo the test.

ART. 5.—The Examining Commission shall rigorously satisfy itself that the candidate fulfils the conditions prescribed in the aforementioned Article X of the Regulations—namely, that he possesses a perfect knowledge of the radiotelegraph apparatus as shall enable him to render efficient radiotelegraph service on board ship.

Candidates must possess the knowledge of radiotelegraphy stipulated in Appendix A (programme of examination for the granting of Government radiotelegraph certificates), signed, on Our order, by the Minister of Marine.

ART. 6.—In addition to the above-mentioned tests candidates must undergo practical tests in transmission and oral reception, the duration of such tests to be not less than ten minutes.

In connection with the provisions of Article X of the Regulations of Service annexed to the International Radiotelegraph Convention of London, shall be issued:

A first-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twenty words per minute in a foreign language;

A second-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twelve and not exceeding nineteen words per minute in a foreign language. An average of five characters per word shall be taken as a basis for calculation.

ART. 7.—The aforementioned certificate shall be designated "Brevetto internazionale di radiotelegrafista" and shall bear the photograph of the holder, duly legalised by the stamp of the authority of the Royal Navy, and the personal description of the holder and the qualifications attained.

ART. 8.—Applicants who have been declared by the Examining Commission to be unqualified to receive the International Radiotelegraph Certificate cannot present themselves for further examination if at least six months have not elapsed from the date of the first examination.

ART. 9.—Radiotelegraphists who have obtained a second-class certificate in radiotelegraphy shall only undergo the examination to obtain a first-class certificate after three months have elapsed from the date of the last examination.

ART. 10.—Candidates who have been found unqualified after two consecutive examinations cannot undergo a further test without the special and exceptional authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 11.—The issue of duplicate international certificates in radiotelegraphy is forbidden without the special authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 12.—Radiotelegraphists must undertake to maintain the secrecy of correspondence.

ART. 13.—All violations of the secrecy of correspondence, of the International Radiotelegraph Convention and the relative regulations, and of the general rules governing the working of radiotelegraph stations open to public service will be punished by the temporary or permanent withdrawal of the radiotelegraphist's certificate, according to the seriousness of the infraction committed by the radiotelegraphist, irrespective of any more severe punishment that may be imposed.

ART. 14.—The present decree will enter into force from the day of its publication in the *Gazzetta ufficiale*.

We order that the present decree, to which has been affixed the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, and we enjoin its observance upon all those whom it may concern.

Given this day, November 4, 1919, at San Rossore.

VITTORIO EMANUELE,
Sechi-Chimienti.

Seen, The Keeper of the Seals:
Mortara.

APPENDIX A.

PROGRAMME OF EXAMINATIONS FOR THE GRANTING OF GOVERNMENT CERTIFICATES IN RADIOTELEGRAPHY.

Diagram of the various radiotelegraph apparatus used and the working of the individual parts.

A perfect knowledge of such apparatus, its adjustment and method of removing faults.

Tuning of a station. Rules relative thereto. Cimoscopi (?)

Receiving apparatus and the mode of using them.

Sources of energy which feed radiotelegraph apparatus: Dynamos, alternators, transformers, converter groups and converters. Accumulators and their maintenance.

Measures necessary in the practice (working) of radiotelegraphy. Voltmeters, ammeter, methods of insulation.

Antennæ and earth.

Precautions to avoid damage to the material and staff during transmission.

Protection devices of the oscillatory circuits.

Perfect knowledge of the general working rules of radiotelegraph stations open to public service, and also of the International Radiotelegraph Convention and the Service Regulations annexed thereto.

Perfect knowledge of the conventional abbreviations.

Knowledge of foreign languages (optional).

Duties of the radiotelegraphist as regards the radiotelegraph service.

Secrecy of correspondence.

Rome, 4th November, 1919.

Seen, by order of His Majesty the King,

SECHI,
Minister of Marine.

ROYAL DECREE No. 1786, DATED 5TH DECEMBER, 1920,

B Requiring all commercial vessels, whether propelled mechanically or by sails, and used for the transport of passengers, and cargo vessels of a gross tonnage of 1,600 or more tons, when proceeding to sea, to be equipped with a radiotelegraph installation. (Published in the *Gazzetta Ufficiale* of the 27th December, 1920, No. 304).

VICTOR EMMANUEL III

By the grace of God and the will of the Nation, King of Italy.

Having seen the Law of June 30th, 1910, No. 395, relative to radiotelegraphy and radiotelephony and the regulations appertaining thereto, approved by Royal Decree of February 1st, 1912, No. 227;

Having seen the Royal Decree of July 11th, 1913, No. 1006, which gives effect to the International Radiotelegraph Convention of London;

Having seen the "Decreti Luogotenenziali" (Provisional Decrees) of the 12th November, 1916, No. 1587, and of 21st January, 1917, No. 180;

Having heard the Council of Ministers;

On the proposal of the Minister for Industry and Commerce, in agreement with the Minister of Marine and with the Minister of Posts and Telegraphs;

WE HAVE DECREED AND WE HEREBY DECREE:

ART. 1.—All commercial vessels whether propelled mechanically or by sails, used for the transport of passengers and cargo vessels of a gross tonnage of 1,600 or more tons must, whilst at sea, carry a radiotelegraph equipment.

ART. 2.—From this obligation to carry a radiotelegraph equipment are exempted vessels used for the transport of passengers and of a gross tonnage of less than five hundred tons, which make voyages of less than ten hours' duration and do not depart more than fifty miles from the nearest coast.

The Ministry of Industry and Commerce shall have power, in exceptional cases, to dispense from the obligation to carry wireless plant those vessels for which wireless telegraphy would not be required, having regard to the coastal route followed by the vessel, local conditions of the voyage and other circumstances.

ART. 3.—Vessels required to carry radiotelegraphic plant are, for the purposes of the radiotelegraph service, divided into three classes according to the classification prescribed for ship stations by Article XIII of the Service Regulations annexed to the International Radiotelegraph Convention signed in London on the 5th July, 1912, namely:

1st Class.—Vessels with ship stations maintaining a continuous service.

In the first class are included all vessels performing long voyages and recognised as suitable for the transport of two hundred or more persons.

2nd Class.—Vessels with ship stations maintaining a service of limited duration.

In the second class are included all vessels performing any service whatever, not classified in the previous class or in the third class mentioned hereunder.

3rd Class.—Vessels with ship stations having no fixed working hours.

In the third class are classified all vessels carrying less than 50 persons, irrespective of the service they maintain.

In determining the number of persons that a vessel can carry, for the purposes of the present decree, account must be taken of the total number of persons composing the normal crew and the maximum number of passengers which the vessel is authorised to carry, according to the certificates issued by the Maritime Authorities.

The owner or agent of a vessel classified in the second or third class, is entitled to require the vessel to be entered in a higher class, should it comply with all the obligations established for a higher class.

ART. 4.—Vessels which are not bound to maintain a permanent listening service but which, by the terms of the present decree, are required to carry a radiotelegraph equipment, must maintain, whilst at sea, a permanent listening service, if the Minister should deem this to be advisable for the safety of human life at sea.

In the event of there being invented and internationally approved an automatic receiving apparatus for the distress call, it shall be permissible on vessels entered in the second class and having two radiotelegraphists, to substitute for one of them a member of the crew, duly authorised for the purpose, even though performing other duties on board.

ART. 5.—The radiotelegraphic plant, imposed by the present decree, must be able to transmit by day, from ship to ship, signals clearly perceptible, in normal circumstances and conditions, at a minimum distance of one hundred nautical miles.

Each vessel which is obliged to carry a radiotelegraph installation must, irrespective of the category in which it is classified, be equipped, in conformity with Article XI of the Regulations annexed to the International Radiotelegraph Convention of 1912, with a radiotelegraph emergency set the parts of which must be protected, as far as possible, from likelihood of damage.

In any case the emergency plant must be situated entirely in the upper parts of the vessel and as high as practically possible.

The emergency plant must have, as indicated in Article XI of the regulations aforementioned, a source of energy entirely its own. The plant must be capable of being brought rapidly into operation and of working for at least six hours with a minimum range of eighty nautical miles for vessels registered in the first class and fifty nautical miles for those entered in the other two classes.

If a normal installation, the range of which, according to the terms of the present article, is at least one hundred miles, meets all the requirements indicated below, the emergency plant is not obligatory.

ART. 6.—Before being put into operation, each installation must be inspected and approved by a Commission composed of an officer of the "Capitaneria di Porto" (Port Authorities),

a delegate of the Ministry of Marine who is a specialist in radiotelegraphy, and an inspector or expert on the Italian Naval Register.

The certificate of inspection and approval which constitutes a working licence, in accordance with the terms of Article 9 of the Regulations annexed to the Radiotelegraph Convention of 1912, shall show the characteristics of the plant in relation to the decree of concession.

It shall be prepared in duplicate, a copy of which shall be handed to the Commanding Officer of the vessel and shall not be issued if the plant does not comply with the conditions established by the Radiotelegraph Convention of 1912 and the previous decree.

Radiotelegraph stations shall be inspected at least once a year by a Commission composed as stated above.

The cost of inspection and approval of apparatus is to be borne by the licensee.

ART 7.—Every captain of a vessel receiving a distress call sent out from a vessel in distress is bound to proceed to the assistance of those in danger.

The captain of any vessel in distress has the right to determine which vessel or vessels, amongst those which have replied to his appeal, he considers most suitable to render him assistance. He shall not avail himself of this right until after consultation, as far as possible, with the captains of the said vessels. The latter are bound to comply at once with the request, and to proceed at full speed to the assistance of those in distress.

The captains of the vessels upon whom it is incumbent to render assistance, are freed from this obligation directly the captain or captains called upon have intimated that they are complying with the summons, or the Captain of one of the vessels which has reached the scene of the accident shall have made known to them that their assistance is no longer necessary.

If the captain of a vessel finds it impossible in the special circumstances of the case, to proceed to the assistance of the vessel in distress, he shall immediately inform the captain of the latter.

He must also enter in his log the reasons justifying his action.

It is incumbent on the licensees of ship stations to report to the General Direction of the Mercantile Marine all violations of the provisions of the present Article.

ART. 8.—For the purpose of Article 1 of the present decree, the owners or agents of vessels shall, within one month from the publication of the present decree, make application to the Minister of Posts and Telegraphs for the requisite licence for radiotelegraph stations to be installed on board existing vessels, not yet equipped with radiotelegraph apparatus and not relieved from the obligation to carry an installation in accordance with the terms of Article 2.

As regards vessels which may become nationalised after the date of the present decree and be thereby under the obligation to carry radiotelegraph apparatus on board, the certificate of nationality or the provisional authorisation will not be issued unless the aforementioned agents or owners prove that they have presented the requisite application for a licence for the respective radiotelegraph ship station.

Owners or agents of vessels can, upon making application to the Ministry of Posts and Telegraphs, arrange for the wireless stations on board their vessels to be operated by private radiotelegraphic firms or companies.

In this case the licence for ship stations may be given to the said firms or companies.

The owners or agents, however, even in this case, are subject to all the obligations and responsibilities which are incumbent on them by reason of the provisions contained in the present decree.

In applications for licences and in applications made in order to secure that radiotelegraph ship stations shall be operated by private radiotelegraph firms or companies, all the characteristics of the vessel shall be indicated with sufficient clearness to enable the classification of the vessel to be determined, in accordance with the previous Article 3.

The aforementioned applications shall be presented to the respective Port Authorities, who, after having ascertained that the characteristics of the vessels indicated in the applications are correct, shall forward the said applications to the General Directorate of the Mercantile Marine.

The latter shall designate the category as above, shall fix the date on which each ship station shall be ready to operate, and, with such indications, transmit the application to the Ministry of Posts and Telegraphs, which will issue the corresponding licence.

For proved cases of *force majeure*, extensions may be granted to the date aforementioned by the Direction General of the Mercantile Marine.

ART. 9.—No clearance will be granted to vessels in respect of which an application for a licence for the installation had not been made within the period specified by Article 8 or to vessels which, having the requisite licence, have not the station in order according to the foregoing provisions and in operation within the period fixed by the terms of the licence, save however, for the provisions of the last paragraph of the preceding Article 8.

As regards vessels which have not complied with the obligation as regards a wireless installation but which have to proceed to sea in order to perform public services or services of national importance, the Ministry for Industry and Commerce shall have power to order the installation and the working of the radiotelegraph station to be effected officially, at the expense of the owner of the vessel.

Payment of such expenses and of those for working the station shall be recoverable in the method indicated in Article 205 of the Code of the Mercantile Marine.

ART. 10.—No alteration is made in the terms of the Royal Decree of the 4th November, 1919, No. 2223, regarding the Issue of International Certificates to Radiotelegraphists.

ART. 11.—The present decree, which supersedes the Provisional Decrees of the 12th November, 1916, No. 1587, and of 21st January, 1917, No. 180, shall come into force from the day of its publication in the *Gazzetta Ufficiale* of the Kingdom and will be presented to Parliament for its conversion into Law.

We order that the present decree, to which the seal of State has been affixed, be inserted in the Official Collection of Laws and Decrees of the Kingdom of Italy, and we enjoin all whom it may concern to observe it and to cause it to be observed.

Given at Rome, 5th December, 1920.

VICTOR EMMANUEL.

Giolitti-Alessio-Sechi-Pasqualino-Vassallo.

Place of seal: Seen by the Keeper of Seals: Fera.

Registered at the Court of Account with Reserve on 20th December, 1920.

Reg. 183. Government Deeds a.f. 116. Gisci.

DECREE 23RD MAY, 1921.

THE MINISTERIAL SECRETARIES OF STATE FOR THE MARINE AND POSTS AND TELEGRAPHS.

C In view of the statute of the 30th June, 1910, No. 305 on Radiotelegraphy and Radiotelephony and the Regulation relating, approved by Royal Decree of the 1st February, 1912, No. 227;

In view of Royal Decree of 11th July, 1913, No. 1006 which ratifies the 1912 International Radiotelegraph Convention of London and the acts added to it;

In view of Royal Decree No. 1480 of the 28th December, 1913, extending the provisions of the said Convention to the Radiotelegraphic Service of the kingdom;

In view of the Ministerial Decree No. 1537 of the 12th November, 1916, and the Royal Decree Law No. 1786 of 5th December, 1920, which makes it obligatory for any category of merchant ships to have radiotelegraphic installations on board;

The necessity being recognised that control on private radiotelegraphic correspondence accepted on board ships should be exercised with the due guarantee;

IT IS DECREED:

ARTICLE 1.—In accordance with the provisions of Article X, Clause 4 of the Regulation annexed to the 1912 International Radiotelegraphic Convention of London, the radiotelegraphic service of every ship station is placed under the supreme control of the commander of the boat who shall exercise the requisite control over all correspondence.

ARTICLE 2.—No radiotelegraphic correspondence can be transmitted or delivered by the ship station unless passed by the commander of the ship.

ROME, May 23rd, 1921.

The Ministers,

Signed.....
Signed.....

ROYAL DECREE No. 1067, DATED 8TH FEBRUARY, 1923.

D Regulations for the Wireless Telegraphic Service (*Gazzetta Ufficiale* No. 125 of May 29th, 1923.)

In virtue of the powers conferred on the Government by Law No. 1601 of 3rd December, 1922;

In view of Law No. 395 of 30th June, 1910, on radiotelegraphy and radiotelephony and the relative regulations for the execution thereof, No. 227 of 1st February, 1912;

In recognition of the necessity to modify the regulations contained in the aforesaid Law No. 395 of 30th June, 1910, by rules corresponding more nearly to the present requirements of the wireless telegraph service;

IT IS DECREED

ART. 1.—The plant for communication by means of electro-magnetic waves, without the employment of connecting conduction-wires, or by means of guided waves, as well as the use of such plant, whether on land, on board ship, or on board of air ships, in Italy, or her colonies, is reserved to the State.

ART. 2.—The Government is empowered to grant concessions or licences for the plant and the working of the services indicated in Art. 1, to any person, body or administration, public or private, of whatever nature.

ART. 3.—The direction and control of the wireless service, and of communication by means of guided waves, shall be in the hands of the Ministry of Posts and Telegraphs (with the exception of those for military purposes).

ART. 4.—In order to avoid interference by public or private wireless communications with the working of such communications as may be permanently established in the military interests, The Ministry of Posts and Telegraphs will, in consultation with the Ministries of War and of Marine, prescribe in the regulations the characteristics regarding the working of public or private wireless communications.

ART. 5.—The Minister of Posts and Telegraphs, in collaboration with the consultative tecnico-legal Commission established by Royal decree No. 71 of 7th January, 1923, will decide:

(a) Controversies which may arise—

1. Between the State and the concessionaires;
2. Between the State departments working wireless communication stations;
3. Between the concessionaires.

(b) As to the redemption of the concessions;

(c) As to the eventual compensation due in the case of redemption, revocation, or suspension of the concessions.

ART. 6.—Concessions for the installation and working of transmitting and receiving wireless stations, whether for public or private use, will be granted by Royal Decree, on the initiative of the Minister of Posts and Telegraphs, in consultation with the consultative tecnico-legal Commission.

On the other hand, authority to set up and work simple receiving stations, for the private use of the concessionaire, will be conferred merely by means of a licence issued by the Ministry of Posts and Telegraphs, even if the stations are designed for the reception of news, music, etc., transmitted from a station which has been granted a concession for this purpose.

The Government is empowered to grant concessions over its own wireless installations to private industry. In such case the concessionaire may be obliged, at the request of the Government, to take over the staff assigned to such installations.

ART. 7.—The concessionaires of transmitting and receiving wireless stations, which are for their own use, to the exclusion of any communication whatever for third parties, will pay, in advance, an annual due, which shall be fixed, by the decree granting the concession, between Lit. 300 and Lit. 12,000, in terms of the regulations which shall be issued by ministerial decree.

In guarantee of the payment of this due, the above-mentioned concessionaires shall be required, at the time of the granting of the concession, to deposit caution money equal to one year's due.

The Ministry of Posts and Telegraphs is empowered to reduce such due to one-half, when the concessions in question relate to stations for important scientific, or instructional purposes, or of public interest.

ART. 8.—Concessionaires of wireless stations which are merely receiving, for private use, will pay to the State, in advance, an annual due which will be prescribed in the licence of concession mentioned in Art. 6, and which will be of an amount between Lit. 180 and Lit. 600 for each station, when such station is authorised to receive messages of various lengths of wave in terms of the above-mentioned regulations.

If, however, the receiving station is guaranteed to receive messages of only one fixed length of wave, the due will be fixed between Lit. 60 and Lit. 240, in terms of the above-mentioned regulations.

If the concessionnaires of the said receiving stations are authorised to admit the public, or persons who have taken out a subscription with them, to participate personally in the receiving of news, or if they employ any method of disseminating the news received, the above-mentioned dues will be quadrupled.

In guarantee of the payment of the due, the concessionaire will deposit, at the time of the granting of the concession, caution money equal to the due for one year.

ART. 9.—The concessionnaires of stations for the public service will pay yearly to the State, in three-monthly deferred instalments, a due equal to a percentage of their gross receipts, according to the balance sheet, and which must in no case be less than 2 per cent. They will, moreover, pay to the State progressive percentages on the nett profit on the share capital, in relation to the entity of the dividends payable to the shareholders, when such dividends exceed 7 per cent. of the capital.

The percentage on the gross receipts and the progressive percentages on the nett profits shall be prescribed in the decree granting the concession.

In guarantee of payment, the concessionaires will make a deposit, the amount of which shall be established in the decree granting the concession, and which shall not be less than Lit. 2,000 for each station.

The caution money will be subject to revision every three years.

In all cases in which the concessionaires have no receipts from the public, the financial arrangements between the State and the concessionaires will be regulated in each individual case by special rules to be laid down in the decree granting the concession.

ART. 10.—The concessions may be suspended or revoked, without any compensation:—

(a) When the installations, by not conforming to the technical conditions laid down in the decree granting the concession, cause a disturbance to other wireless stations, either belonging to the State, or for public use;

(b) For serious and repeated infractions by the concessionaire of the obligations laid down in the decree granting the concession;

(c) In all other cases provided for by the regulations relative to this decree.

ART. 11.—The Government is empowered at any time to resume possession of wireless stations, on giving a year's warning.

It is, however, in the power of the Ministry, to renounce the exercise of this right for a fixed number of years, up to 15.

The redemption shall include the cession of all materials and apparatus, and, in certain cases, of the building where the station is situated and the vesting in the State of all the rights of the concessionaires, including those involving third parties.

The price of the redemption shall be decided, after the consultative tecnico-legal Commission has given an opinion, in agreement with the concessionaires, and must not exceed the value of the material in operation at the time of the estimate, taking into account depreciation for the period since the initiation of the undertaking and of any enlargements and renewals.

In the event of disagreement, the decision shall rest, without appeal, with three arbiters, chosen respectively by the Government, the concessionaire and the President of the Court of Appeal at Rome.

If a controversy should arise involving more than one concessionaire, and if the concessionaires are unable to agree as to the nomination

of their arbiter, each of them shall propose a name, and one of the names so chosen shall be drawn by lot, in the presence of a judicial delegate of the President of the Tribunal of Rome.

The Government may take possession of the radiotelegraphic stations without waiting until the redemption price shall have been fixed.

ART. 12.—The length of the concession will be laid down in the relative decree, but must not exceed 25 years.

ART. 13.—The Government is empowered to suspend, limit, or take over, for serious reasons of a military character, or affecting public security, the working of stations which have been conceded.

When, in the exercise of such power, the State is obliged to pay indemnities, these must not exceed, in each case, an amount corresponding to the working expenses which may remain as a charge on the concessionaire, as well as interest and amortisation of capital.

ART. 14.—The concession is personal; the concessionaire is therefore forbidden to let or cede the concession, either in whole or in part, without the express authority of the Ministry of Posts and Telegraphs.

ART. 15.—An obligation is laid upon the concessionaire to maintain and guarantee secrecy as regards the telegraphic and telephonic service and to answer for the work done by his dependents.

ART. 16.—The Ministry of Posts and Telegraphs (after taking the opinion of the consultative tecnico-legal Commission) is empowered to fix and modify the tariffs for the public wireless service.

When the service has been conceded, as laid down in Article 2, the tariffs must be submitted to the approval of the above-mentioned Ministry by the Concessionaires, and the Ministry may, even during the course of the concession, require that they should be reduced, when the nett profits of the undertaking exceed ten per cent.

ART. 17.—The personnel of all wireless stations, of whatever nature, or stations for guided waves, administered by any public or private body, must hold the certificate granted by the Ministry of Posts and Telegraphs, after examination on lines laid down, in consultation with the consultative tecnico-legal Commission.

The Ministry of Posts and Telegraphs is empowered to oblige the concessionaire to dismiss personnel employed by him in the service of the installations whom he considers no longer fit for such duties, in the interests of public safety; and also, for the same reasons, to forbid the engaging of employees.

ART. 18.—Every infraction of Article 1 of this decree is punishable with a fine not exceeding Lit. 2,000 and with imprisonment for a period not exceeding one year, these penalties being applicable cumulatively or separately, according to circumstances.

The magistrate is also empowered to order the confiscation of the apparatus.

While awaiting penal proceedings, the Ministry of Posts and Telegraphs, may, if requested by the Prefect, in the public interest, take possession of the installations and provide, if it seems good to him, for their removal or for their management direct, on the strength of a prefectorial decree.

ART. 19.—Anyone causing destruction or damage to the installation, or interrupting or compromising, even temporarily, the wireless service, or abusing the signals for help reserved for ships or airships in danger, will be punished under Article 315 of the penal code. In the

case of soldiers, the punishments will be those laid down in the Military Penal Code.

It is understood that the punishments laid down in this decree are without prejudice to those of greater magnitude which may be awarded in terms of the military and civil penal code.

ART. 20.—Contrary to Article 12 of Law No. 2356 of 25th June, 1865, our Minister of Posts and Telegraphs is empowered to issue a declaration of public utility, in so far as referring to the installations mentioned in Article 1 of this decree.

Such power may be exercised by this Minister, if he thinks it necessary, on the request of the concessionaires mentioned in Article 2 of this decree.

ART. 21.—Law No. 395 of 30th June, 1910, Regulation No. 227 of 1st February, 1912, and every other disposition which is contrary to this decree, is repealed.

ART. 22.—The power to issue Regulations, by ministerial decree, after consultation with the consultative tecnico-legal Commission, for the execution of this decree, is delegated to the Government.

TEMPORARY PROVISIONS.

ART. 23.—While waiting for the publication of the regulations for the execution of this decree, the following temporary measures are enacted:

The request for a concession in respect of wireless installations must contain:

(a) A precise indication of the person or body making the request; if the concession is requested by a person, the penal certificate issued by the office of judicial registers, and the certificate of good conduct issued by the Syndic of the commune in which the applicant is legally domiciled, or habitually resides, must be attached to the request.

If the concession is requested by a body, or by a commercial company, an authentic copy of the Articles of Association of the body or company, and of its statute, and proof of the execution of the formalities legally necessary in order to perfect the constitution of the body or company, must be attached to the request.

Requests for concessions must all, without exception, bear the visa of the Prefect of the province where the person making the demand resides;

(b) an indication of the nature and scope of the concession, of the locality of the installation and of its supposed range;

(c) an indication of the length of time for which the concession is asked, and between what dates the station is likely to be in working order.

The dues mentioned in Articles 7, 8 and 9, will be fixed by the Ministry of Posts and Telegraphs, after consultation with the consultative tecnico-legal Commission.

The maximum plans of the installation must be attached to the requests for a concession.

ROYAL DECREE, No. 1262, DATED 5TH JUNE, 1923.

E SUPPLEMENTING THE PROVISIONS OF ROYAL DECREE, No. 1067 OF 8TH FEBRUARY, 1923, CONCERNING THE WIRELESS TELEGRAPHIC SERVICE (*Gazzetta Ufficiale*, No. 144 of 20th June).

In virtue of the powers conferred on the Government by Law No. 1601, of 3rd December, 1922;

In view of Royal Decree No. 1067, of 8th February, 1923,

IT IS DECREED:

ART. 1.—The following Articles are appended to the transitory dispositions of Royal Decree No. 1067, of 8th February, 1923 :

ART. 24.—The Minister of Posts and Telegraphs has the power, up to three months from the publication of the Regulations mentioned in Art. 22, to revoke entirely the concessions granted before the publication of the present decree, for which the relative plant is not installed and placed in operation, and those for which part of the conceded plant is in operation, in so far as concerns the plant not installed, without the right of the concessionaire in any case to indemnity or compensation under any title.

ART. 25.—Until the Ministry of Marine shall provide with proper personnel for the functioning of wireless stations, which in addition to military service, simultaneously perform that of the correspondence of the Government and the public, the management and technical control of such stations shall continue to be entrusted to the Ministry of Marine, which in this regard shall act in agreement with the Ministry of Posts and Telegraphs.

For this purpose and for the time indicated in the preceding paragraph in virtue of Royal Decree No. 764, of 18th March, 1923, two officials of the Ministry of Marine and one of the Ministry of War shall be delegated by the respective Ministries to take part, in a deliberative capacity, in the work of the technical legal consultative commission, instituted by Royal Decree No. 71, of 7th January, 1923, in so far as questions of wireless telegraphy are concerned.

ART. 2.—The exceptions to the dispositions of paragraphs 1 and 2 of Article 17 of Royal Decree No. 1067, of the 8th February, 1923, defined by paragraph 3 of the said Article, are extended to the stations on board ship for which the Ministry of Marine will provide.

ART. 3.—The permanent consultative commission for wireless services, constituted by the Law No. 395 of the 30th June, 1910, is suppressed.

ART. 4.—The present decree will be effective from the date of its publication in the *Gazzetta Ufficiale*.

JAPAN

(See Maps 17 and 19).

Including : Hokoto (Pescadores), Sakhaluin (Karafuto), Kwantung, Formosa, Korea, Kiau-Chaw.

THE Japanese claim that their empire was founded in 660 B.C., and that the dynasty of its foundation still reigns. The present Emperor is Yoshihito (Harunomia), who retains the rights of sovereign, and is assisted by a Cabinet and Privy Council.

CONTROL.

The Department of Communications controls all Government stations and inspects all private stations in Japan. These are divided as follows :—

Government Land Stations	.. .. .	9
Private Land Stations	.. .. .	6
Government Ship Stations	.. .. .	45
Private Ship Stations	.. .. .	248

Besides these stations there are five Government stations, under the jurisdiction of the Government-General of Korea and Kuantung, all open for public communication. In addition, there are many Navy and Army stations under the control of the Navy and Army Departments.

Wireless work in the Department of Communications is divided into two sections : (a) The Research Laboratory, and (b) the Installation and Inspection Section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. Narakichi Yoneda	Director-General of Posts and Telegraphs	Tokyo
Mr. Uтарo Noda ..	Minister of Communications ..	Tokyo
Mr. Toyosuke Hada ..	Vice-Minister of Communications ..	Tokyo

WIRELESS RESEARCH LABORATORY.

Official.	Title.	Address.
Dr. W. Torikata ..	Director of Electro-technical Laboratory.	—
Mr. E. Yokoyama ..	Chief of Wireless Research Laboratory.	1, Kihara-machi Omori, near Tokyo
Mr. K. Kitamura ..	Wireless Engineer	702, Nakashibuya, suburb Tokyo

WIRELESS INSTALLATION AND INSPECTING SECTION.

Official.	Title.
Mr. M. Saeki	Chief of Wireless Installation and Inspection.
Mr. T. Nakagami	Wireless Engineer

A large wireless station is now working in Formosa constructed by the Japanese Navy with materials produced in Japan. It was opened for service early in 1920.

The stations of Fukuoka and Fusan are being equipped for wireless telephony for communication across the Chosen Strait. This forms part of the Government plan for linking up the various islands of the Empire by Wireless.

Several new stations are under construction, and wireless services between Japan and America and Hawaii will soon be in operation *via* the new Iwaki station. The receiving station is at Tomioka, and was opened on May 1st, 1920, and the transmitting station is at Haraniomach, not yet completed.

The Fisheries and each Meteorological Observatory are being installed with wireless, and a new station in Osaka will soon be opened for press services with Europe and America.

The Japanese Government has also decided to erect wireless stations on all the islands along the coast.

A new telegraph training school has been erected at Meguro, a suburb of Tokyo, at a cost of 300,000 yen, and has been specially adapted for the training of radiotelegraph operators.

A fortnightly magazine devoted to the study of wireless telegraphy and telephony, and a monthly magazine named *Musen-no-Nippon*, or *Wireless Press*, are published by the Wireless Press Agency.

ADMINISTRATION.

The first wireless regulations in Japan were promulgated in April, 1908, under the Telegraph Law of 1900. A number of additions and modifications have since been made of these regulations, and these are now incorporated in the Wireless Telegraph Law, which was promulgated and took effect in 1915. The texts of these laws and regulations now in force are shown in the following pages in accordance with the list below:—

A—Wireless Telegraph Law No. 26.

B—Wireless Telegraph Regulations No. 16 (Japanese reference No. 41-48).

C—Foreign Wireless Telegraph Regulations.

D—Regulations relating to Private Wireless Telegraphs.

E—Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

F—Regulations regarding the qualifications of wireless operators:—

(i) Substitution of Foreign Operators.

(ii) Qualification of Wireless Operators on Fishing Trawlers.

(iii) Amendment to the Regulations regarding qualifying examination for Operation of private Wireless Telegraphs.

WIRELESS TELEGRAPH LAW.

(Law No. 26, June 19th, 1915.)

A ART. 1.—All wireless telegraphs and telephones shall be under the control of the Government.

ART. 2.—Wireless telegraphs and telephones referred to below may be privately established with the permission of the responsible Minister, to be determined by an Order.

(i) Installations on board vessels with the object of assuring safety to navigation,

(ii) Installations on board vessels for communication between vessels engaged in a specific business belonging to one person, with the object of facilitating such business.

(iii) Installations on board vessels or on land for the exclusive use of private persons and communicating with telegraph offices for the dispatch and receipt of telegrams, but disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications.

(iv) Installations on board vessels or on land with the object of facilitating a specific business belonging to one person by mutual communication on land or between land and vessel, disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications, but to which the preceding clause is not applicable.

(v) Installations with the exclusive object of carrying out experiments in connection with wireless telegraphy or telephony.

(vi) Installations recognised as necessary by the responsible Minister, but not coming within the purview of the preceding clauses.

ART. 3.—Restrictions relating to private wireless telegraph and telephone apparatus, their installation and employment, together with the qualifications of persons operating private wireless telegraphs, will be determined by an Order.

ART. 4.—Private wireless telegraphs and telephones must not be used for purposes other than those for which they were established. Provided that their use shall not be prevented for signals of distress at sea, meteorological reports, time signals and in other cases, to be determined by an Order, where public utility is recognised by the responsible Minister.

ART. 5.—Wireless telegraphs and telephones installed on foreign ships may only be used in accordance with the provisions of Article 2. Provided that their use shall not be prevented for signals of distress at sea and for communications with telegraphs and telephone offices whilst on voyage.

ART. 6.—The responsible Minister may, by the issue of an Order, cause private wireless telegraphs or telephones to be used for the public service or for communications necessary for military purposes.

In cases coming within the purview of this Article the responsible Minister may, where deemed necessary, send officials to carry out the required operation.

ART. 7.—Where the responsible Minister deems it necessary in the interests of the public communication or on military grounds, he may withdraw his sanction from private wireless telegraphs or telephones or order changes in their equipment.

ART. 8.—Where the responsible Minister deems it necessary for the sake of public security, he may order a restriction of or suspension in the working of or the removal of instruments and accessories belonging to private wireless telegraphs or telephones or wireless telegraphs or telephones installed on foreign vessels.

In cases coming within the purview of this Article, the responsible Minister may, where deemed necessary, send competent officials to seal up instruments and accessories or to effect their removal.

ART. 9.—Where persons responsible for private wireless telegraphs or telephones have contravened this Law, Orders based on this Law, or provisions arising therefrom, the responsible Minister may withdraw his sanction from such wireless telegraphs or telephones or order the suspension of their operations.

ART. 10.—Where sanction has been withdrawn from wireless telegraphs or telephones established by private persons the dismantling of their apparatus and mountings will be required by order of the responsible Minister. This applies also in the case where private wireless telegraphs or telephones have ceased operations.

ART. 11.—Where private wireless telegraphs or telephones or wireless telegraphs or telephones established on foreign vessels have been called upon to deal with signals of distress at sea, such service must be refused.

ART. 12.—Immediately on receipt of signals of distress at sea, wireless telegraphs or telephones shall acknowledge them and report to the wireless telegraph or telephone most conveniently situated for purposes of rescue.

In cases coming within the purview of this Article, where request has been made for communication on specific matters, such communication should immediately be made regardless of the provisions of this Article.

ART. 13.—Where the responsible Minister has ascertained that any person has illegally set up a wireless telegraph or telephone, he may appoint competent officials to enter such establishment, inspect the apparatus and mountings thereof, effect the removal of instruments and accessories, and take other steps appropriate to the circumstances.

ART. 14.—The Government may, for the purpose of establishing wireless telegraphs or telephones to meet the needs of public communications, require the use of part of a vessel, and in case of necessity order special provision and equipment. Under the provisions of this Article a suitable rent for accommodation and actual cost of special provision and equipment will be paid by the Government on application.

ART. 15.—Matters relating to the administration of wireless telegraphs, wireless telephones, telegraphs, telephones, mails, postal money orders and post office savings, or signals of distress at sea, time signals and meteorological reports may as determined by an Order be communicated free of charge by the wireless telegraphs or telephones provided for the public service.

ART. 16.—Persons who have set up wireless telegraphs or telephones without permission, or have made use of wireless telegraphs or telephones set up without permission, or those who have made use of private wireless telegraphs or telephones after permission has been withdrawn will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

ART. 17.—Persons using private wireless telegraphs or telephones for purposes other than those for which they were established will be subjects to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

Persons applying to and having messages sent by private wireless telegraphs or telephones will be subject to a fine not exceeding one hundred yen.

ART. 18.—Persons contravening the provisions of Article 5 or disobeying orders based on this Law for restricting or suspending the use, changing the equipment of or removing or dismantling wireless telegraphs or telephones will be subject to a fine not exceeding one

thousand yen. Where persons engaged in the business of wireless telegraphs or telephones have used them in opposition to Orders for their restriction or suspension, this provision shall apply also to such persons.

ART. 19.—Persons refusing without just cause to furnish the use of wireless telegraphs or telephones under the provisions of Article 6 or of vessels or failing to make special provision or equipment under the provisions of Article 14, will be subject to a fine not exceeding one thousand yen.

ART. 20.—Persons violating the secrecy of wireless telegraph or telephone messages coming under treatment at telegraph or telephone offices will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have divulged the secrets of messages under the provisions of this Article they shall be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

The offences dealt with in this Article must be established by prosecution.

ART. 21.—Persons illegally evading charges connected with wireless telegraphs or telephone or causing other persons to evade them will be subject to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have committed acts referred to in the preceding paragraph, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding five hundred yen.

ART. 22.—Persons dispatching false communications by wireless telegraph or telephone with the object of causing harm to other persons will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

Persons dispatching false communications by wireless telegraph or telephone with the object of adversely affecting the public welfare will be subject to penal servitude for a period not exceeding five years or to a fine not exceeding one thousand yen.

Persons dispatching by wireless telegraph or telephone reports of shipping casualties when there are in fact no shipping casualties will be subject to imprisonment with hard labour for a period of not less than three months and not exceeding ten years.

Persons engaged in the business of wireless telegraphs or telephones who have committed acts referred to in the first clause will be subject to imprisonment with hard labour for a period not exceeding five years or a fine exceeding one thousand yen; in the second clause to penal servitude for a period not exceeding ten years; in the third clause to a term of imprisonment with hard labour of not less than one year.

ART. 23.—Where persons engaged in the business of wireless telegraphs have without just cause opened, damaged, concealed or thrown away telegrams sent by wireless telegraphy and coming under treatment at telegraph offices, or have delivered them to persons other than their proper recipients, they will be subject to penal servitude for a period not exceeding three years or to a fine not exceeding five hundred yen. Provided that cases coming within the purview of Articles 258 and 259 of the Criminal Code shall be dealt with according to that Code.

ART. 24.—Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, neglected to deal with general public telegrams or communications necessary for military purposes, or have caused them to be delayed, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, failed to deal with reports of distress to vessels under the provisions of Articles 11 or 12, or have caused them to be delayed, they will be subject to a term of imprisonment with hard labour of not less than one year.

Persons obstructing communication of reports of distress at sea will similarly be dealt with under the preceding clause.

ART. 25.—Persons obstructing, or committing acts calculated to obstruct, general public communications or communications necessary for military purposes sent by wireless telegraph or telephone will be subject to penal servitude for a period not exceeding seven years or a fine not exceeding five hundred yen.

ART. 26.—Unconsummated attempts to contravene the provisions of the last ten Articles are punishable.

ART. 27.—Persons opposing, hampering or avoiding the competent officials appointed under the Law in the execution of their duty or failing to answer their questions or making false statements during the inspection required under the provisions of Article 13 will be subject to a penalty not exceeding one hundred yen.

ART. 28.—The provisions of the Telegraph Law, Articles 4, 5, 11 to 21, 23, 24 and 45, apply to wireless telegraphs and telephones employed for the general public service and communications necessary for military purposes.

SUPPLEMENTARY REGULATIONS.—The date of coming into force of this Law will be fixed by Imperial Ordinance.

The above Wireless Telegraph Law came into force on November 1st, 1915. Imperial Ordinance No. 186, October 25th, 1915.

WIRELESS TELEGRAPH REGULATIONS. No. 16.

DATED APRIL 8TH, 1908.

B ART. 1.—The expression "wireless telegram" means any telegram to be transmitted by wireless telegraphy.

ART. 2.—In the present Regulations the term "coast station" means any telegraph office on land equipped with wireless telegraph apparatus, and the term "ship station" means any telegraph office on board a ship equipped with wireless telegraph apparatus.

ART. 3.—Wireless telegrams shall bear the following abbreviated instruction:—

"R A" in the case of Romanised telegrams.

ART. 4.—The name of a coast station through which a wireless telegram destined for a ship station is to be transmitted shall be indicated within parentheses in the address of the telegram, but such indication shall not be counted in the number of words even in the case of a Romanised telegram.

In case such coast station cannot transmit the telegram, but there is another coast station which is able to do so, the intermediary of the latter may be resorted to. If a telegram destined for a ship can be delivered direct to

the addressee from a telegraph office on land, it may be delivered from such office without the use of wireless telegraphy.

(a) Wireless telegrams to be transmitted by way of intermediate ship station, with the exception of those handed in at a ship station, shall bear the following abbreviated instruction:—

“RS” in the case of Romanised telegrams.

Such intermediary transmission can in no circumstances be made more than once.

ART. 5.—If the sender of a wireless telegram destined for a ship station wishes to indicate the term during which his telegram is to be kept at the coast station, the number of days shall be inserted in the telegram as paid instruction.

Wireless telegrams without such instruction will be retained at the coast station for nine days from the day of handing in. However, in case the transmission of a telegram cannot be effected on account of the ship's station leaving out of the radius of action of the coast station or for any other reason, the telegram may not be retained, if the retention is deemed unnecessary.

ART. 6.—In the sender wishes to prolong the term of retention mentioned in Art. 5, application to that effect shall be made to the coast station before the expiration of the term. The same applies to further prolongation of the term. In such case, the term of retention will be nine days, unless specially indicated.

The application shall contain the date of handing in, number of characters or words, and the names of the sender and addressee of the wireless telegram.

The sender may make the application mentioned in paragraph 1 through the office of origin. If he wishes it notified to the coast station by telegraph, he shall pay the charge for a paid service telegram for the purpose.

ART. 7.—The transmission of a wireless telegram is to be effected when both the sending and receiving offices are within the guaranteed range of action of each other.

ART. 8.—In the case of ship's distress, wireless telegrams informing the name of the ship in distress the location and condition of the doomed vessel and any other particulars necessary for rescue, shall be treated by coast or ship station with absolute priority suspending all other communications.

ART. 9.—Paid service telegrams concerning enquiry, rectification, and stoppage of a wireless telegram to which reply is required can be exchanged only between telegraph offices on land.

ART. 10.—“Urgent telegrams,” “redirected telegrams,” and “telegrams with acknowledgment of receipt” are admissible between telegraph offices on land.

The sender of a wireless telegram with acknowledgment of receipt will be notified of the date and time at which the coast station has transmitted the telegram to the ship station.

(a) Telegrams of the same text originating from the same ship station or from the same telegraph office on land, and passing through the same coast station, may be made a multiple telegram, so far as concerns the transmission between wireless telegraph stations or between telegraph offices on land, as the case may be, no matter whether the addresses of such telegrams be in different localities or they be served by different offices of destination. The telegram shall bear the following abbreviated instruction instead of that for an ordinary multiple telegram:

“SM” in the case of Romanised telegrams.

Paragraph 2 of Article 4 is not applicable to the multiple telegram mentioned in the preceding paragraph when it is to be distributed to two or more ship stations, unless every copy of such telegram can be transmitted through the same coast station or delivered from the same telegraph office on land.

(b) Reply-paid wireless telegrams shall bear the abbreviated instruction for “reply paid,” “urgent reply paid,” or “collated reply paid” completed by the mention of the prepaid amount. If a prepaid amount is 60 sen in the case of kana telegrams, and 75 sen in the case of Romanised telegrams, the mention of the amount is not required.

ART. 11.—Wireless telegrams are subject to the following charge for the operation at a coast station or a ship station in addition to the ordinary telegraph charge. It is provided, however, that the ordinary telegraph charge is not levied on a telegram which is to be transmitted only by wireless telegraphy.

For Government and Ordinary Telegrams:

Coast Charge.—For a kana telegram, 20 sen up to fifteen characters; 5 sen for every additional five characters or less. For a Romanised telegram, 25 sen up to five words; 5 sen for every additional word.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charges.—20 sen for every fifty characters or fraction thereof.

Ship Charge.—Ditto

(a) The following charge is levied in the same way as mentioned in the preceding Article on a supplementary copy of a multiple wireless telegram.

For Government and Ordinary Telegrams:

Coast Charge.—For a kana telegram, 10 sen for a Romanised telegram, 15 sen.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charge.—One-half the charge for the original telegram.

Ship Charge.—Ditto.

(b) If, in the case where Paragraph 2 of Article 4 is applied, the amount paid fall insufficient, the deficiency is collected from the addressee. In the case of a multiple telegram the amount to be collected is divided by the number of copies, and the quotient shall be the sum collected from one addressee.

ART. 12.—Wireless telegrams are free from special charge applicable to telegrams handed out of the ordinary hours of duty.

ART. 13.—The following charges for a wireless telegram shall be refunded less the amount which had been appropriated for another charge:—

(1) The charges pertaining to the transmission by wireless telegraphy when not effected.

(2) The charges pertaining to the transmission on telegraph lines when not effected.

ART. 14.—An application for the refund of charges for a wireless telegram handed in at a ship station may be send in through any telegraph office.

ART. 15.—The term of retention mentioned in Articles 5 and 6 is not reckoned in the period of delay giving rise to refunds.

ART. 16.—Matters not expressly provided for in this Ordinance are subject to the other regulations relating to inland telegrams. Provided that the Regulations relating to Telegrams,

Articles 71, 114, 121, 126 to 130, 146 to 148, 148 (vi) to 148 (x), Ordinance No. 46, issued by the Department of Communications in September, 1900, shall not apply.

(a) With the exception of Article 9 to Article 10 (b) and the proviso in Article 16, the regulations in this Ordinance shall apply in the treatment of connected service between wireless telegraphs and the reciprocal dispatch and receipt of telegrams on land. Provided that, if deemed necessary by the Department of Communications, charges for such service shall be specially fixed.

The treatment of, and special fixing of charges for, wireless telegrams referred to in the preceding clause will be separately notified.

FOREIGN WIRELESS TELEGRAPH REGULATIONS.

C The following supplementary regulations came into operation on July 1st, 1913, and apply to all Japanese possessions:—

ART. 1.—Foreign wireless telegrams are understood to be those which are treated according to the regulations of the London International Radiotelegraphic Convention or to the regulations concerning the radiotelegraphic service concluded between the Government of the Empire and foreign Governments or companies.

ART. 2.—The rates to be charged for foreign messages through Japanese coast and ship stations are as follows:—

(1) Coast station rate, 24 yen (fr. 0.60) per word.

(2) Ship station rate, 16 yen (fr. 0.40) per word.

The coast station rate referred to in the preceding paragraph includes the rate applicable to the transmission on telegraph lines for wireless messages originating in or destined for the Japanese Empire or Southern Manchuria or for ship's stations and the Japanese telegraph service. As regards urgent wireless messages for transmissions over land lines, an extra 10 yen (fr. 0.25) will be charged.

ART. 3.—The rates to be charged for foreign radiotelegrams through foreign coast or ship stations will be indicated separately.

ART. 4.—The ordinary rate for foreign wireless messages accepted by a Japanese ship station for transmission through a foreign coast station will be fixed by the owners of the said foreign coast station.

ART. 4.—For the acknowledgment of receipt of foreign wireless messages handed in at a Japanese telegraph office and destined for a ship station and transmitted thereto through a Japanese wireless coast station, the rate for the acknowledgment of receipt of interior telegrams for transmission between Japan and Southern Manchuria will be charged.

ART. 6.—At the request of the receiver, or of the person empowered to receive messages for and on behalf of the receiver, wireless messages may be retransmitted only over Japanese land lines.

ART. 7.—When the Japanese coast station given by the sender of a foreign wireless message destined for a ship cannot transmit the said message it may be transmitted through another Japanese coast station, provided such station is suitable for the purpose. This provision also applies in case the Japanese ship station cannot transmit a foreign wireless message to a Japanese coast station mentioned by the sender and where another Japanese coast station exists and which is capable of performing the duty.

ART. 8.—Japanese ship stations cancel foreign wireless messages when they are not in a position to transmit the same to the corresponding stations.

ART. 9. (i)—Should a foreign wireless message be cancelled in accordance with Article 8, the sender shall be at once advised and the money paid by him returned without delay.

(ii) Foreign wireless telegrams passing between the Imperial [Japanese] Telegraph Office in Shanghai and Imperial ship stations through the intermediary of Imperial coast stations and, as circumstances require, ship stations may be entered in the Japanese language.

(iii) Article 3, Article 4, Clauses i and ii and Article 5, clause i, of the Wireless Telegraph Regulations, Ordinance No. 16 of the Department of Communications, issued in April, 1908, provide for foreign wireless telegrams in Japanese.

(iv) Reply prepaid foreign wireless telegrams in Japanese must be marked "reply prepaid" followed by the amount paid for reply.

(v) Foreign wireless telegrams dispatched or received at the places announced separately will be transmitted through the intermediary of telegraph offices specially indicated.

(vi) The treatment of foreign wireless telegrams in accordance with the preceding Article is subject to the general regulations relating to foreign telegrams.

ART. 10.—Matters not specially provided for in this Ordinance as regards Japanese telegrams, foreign telegrams in Japanese, and other items, are subject to the general regulations relating to foreign telegrams.

REGULATIONS RELATING TO PRIVATE WIRELESS TELEGRAMS.

D (Ordinance No. 46, Department of Communications, October 26th, 1915.)

ART. 1.—The words "disconnected from public communications" in clauses iii and iv Article 2, of the Wireless Telegraph Law mean that the location for fitting up private wireless telegraph apparatus must be outside the boundaries of direct telegram delivery or telephone subscription or on vessels on which no telegraph office is established.

ART. 2.—Wireless telegraphs set up in accordance with clause v, Article 1, of the Wireless Telegraph Law are limited to provision for experiments connected with the science and apparatus of wireless telegraphy.

ART. 3.—Permission will be given to the furnishing of vessels with aerial apparatus and its use for wireless telegraphy by private persons.

ART. 4.—The apparatus and equipment of private wireless telegraphs, except in specially indicated cases, will be required to conform with the following clauses:—

(i) The apparatus must be capable of transmitting eighty *kana* characters or twenty European words per minute.

(ii) The receiving apparatus must be capable of receiving messages transmitted on electric wavelengths of from 100 to 1,800 metres.

(iii) The power supplied to the transmitting circuit corresponding to the distance required to be reached in the daytime must not exceed the following standards (measured at the primary coil of the transformer or at some point corresponding thereto).

Required daytime distance.	Electric power.
20 naut. miles, not exceeding	1 kilovolt amps.
100 " " "	1 " "
200 " " "	1 " "
300 " " "	2 " "
400 " " "	3 " "
500 " " "	7 " "

(iv) The electric waves should be pure and as little damped as possible. The installation must be capable of using waves of such length as may be specifically indicated between 100 and 1,800 metres.

ART. 5.—The establishment and maintenance of private wireless telegraphs required to be installed at certain telegraph offices in accordance with clause iii, Article 2, of the Wireless Telegraph Law will be carried out by the Communications Office having local jurisdiction or a first-class post office dealing with branch administrative business.

Persons establishing private wireless telegraphs under this Article must be responsible for the supply of and expenditure on articles required for their establishment in accordance with details furnished by the Communications Office having local jurisdiction or the first-class post office dealing with branch administrative business, and must further pay expenses of maintenance.

ART. 6.—Persons proposing to establish private wireless telegraphs must append to their application documents inscribed with particulars under the following headings, submitting the whole to the Minister of Communications. Changes occurring under headings (i) to (iv) must similarly be notified.

(i) The object of the installation and grounds for its necessity.

(ii) Site of installation (full address or name of vessel).

(iii) Plan of construction (nature of apparatus, method of mounting, height of electric standards [masts], electric power, distance required to be reached in the daytime, details of supplementary equipment where required).

(iv) Hours open for operation.

(v) Nature of vessel, gross tonnage, owners, course navigated, and regular port of mooring (the principal home port of anchorage should be taken as the regular port of mooring).

(vi) Time required for completion.

The site of installation on vessels under heading (ii) and the plan of construction under heading (iii) should be illustrated by separate drawings.

ART. 7.—Where changes have been made in details under headings (v and vi) of the preceding Article, they must at once be notified to the Minister of Communications. In the case where the regular port of mooring has been changed such change must be notified also to the Communications Office having jurisdiction over, or the head post office dealing with branch administrative business at, the former port of mooring.

ART. 8.—When the fitting up and construction of a private wireless telegraph have been completed, the fact must at once be notified to the Minister of Communications.

ART. 9.—When the Minister of Communication has received a report under the preceding Article, he will send inspectors to examine the apparatus and fittings, after which a licence will be granted. Provided that where a special inspection is not deemed necessary a licence may be issued forthwith. If deemed specially desirable by the inspectors under this

Article a temporary licence will be issued for the opening of operations by the private wireless telegraph concerned.

ART. 10.—When a private wireless telegraph establishment is to be closed up, a notification to this effect must be sent to the Minister of Communications seven days earlier. Similar notice must be given in the case of suspension of a private wireless telegraph establishment.

ART. 11.—When a private wireless telegraph establishment has been closed up, the aerials must be removed immediately, and, unless special instructions have been given, apparatus specially pertaining to wireless telegraphy—dynamoes, secondary electric batteries, distributing apparatus, electromotors, motor generators, transformers, electric standards, transmitters, receivers, meters, etc.—must be dismantled and removed within ten days. Where sanction to a private wireless telegraph has been withdrawn the same provision applies.

ART. 12.—When a change is made in the proprietorship of a wireless telegraph installation, a written application for permission, jointly signed with both old and new names, must be submitted to the Minister of Communications.

Where, owing to succession on the decease of the proprietor or other causes, joint signatures cannot be obtained, a certificate to this effect must be appended to the application.

ART. 13.—The length of electric waves and the call signal to be adopted by a private wireless telegraph will be decided by the Minister of Communications.

ART. 14.—When a private wireless telegraph has been sanctioned by the Minister of Communications details of the installation under the following headings will be officially announced. This applies also to changes effected therein:—

(i) Name of person setting up installation

(ii) Object of installation.

(iii) Site of establishment.

(iv) Call signal.

(v) Ordinary range of distance.

(vi) Method of fitting up.

(vii) Electric wavelength used.

(viii) Hours open for operation.

ART. 15.—Operators of private wireless telegraphs are required to possess the proper qualifications in conformity with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs. Provided that exception be made in the case of operators of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, who have received the special sanction of the Minister of Communications.

ART. 16.—Proprietors of private wireless telegraphs must notify the Minister of Communications of all appointments or dismissals of operators in the employ. In the case of appointments, copies of antecedents forms, certificate of physical examination and certificate of eligibility awarded on qualifying examination for operators of private wireless telegraphs must be appended.

ART. 17.—Where the Minister of Communications has ascertained that an operator of a private wireless telegraph is incompetent in the performance of his duties he may order the dismissal of such operator.

ART. 18.—A private wireless telegraph establishment shall not begin operations until a licence or temporary licence has been received in accordance with Article 9.

ART. 19.—When a private wireless telegraph establishment has begun operations the Minister of Communications must at once be notified accordingly. Provided that when the installation is one set up in accordance with clause iii, Article 2, of the Wireless Telegraph Law, notification will be required seven days before the opening of operations.

This Article applies also to reopening of operations after notification of suspension has been made in accordance with Article 10.

ART. 20.—The employment of private wireless telegraphs is required to conform with the following paragraphs. Provided that exception be made in the case of communications falling within the purview of Articles 22 to 24.

(i) Only when not causing disturbance to messages sent by the general public or to military communications.

(ii) In the case of installations on vessels, only whilst on voyage.

(iii) In the case of installations set up in conformity with clause v, Article 2, of the Wireless Telegraph Law, only when not causing disturbance to communications from other wireless telegraphs.

ART. 21.—Communications sent by private wireless telegraphs must be in Morse symbols, and the method of transmission, except where special instructions are issued, must conform with the following provisions:—

(i) Before making a call, the receiver must be regulated to the best degree of perception to determine whether a message is already in transmission. A call must not be made until such message, if any, is completed.

(ii) When making a call the "begin communication" signal $\text{---} \bullet \bullet \bullet \text{---}$ must first be sent, followed by the call signal of the party signalled, repeated three times, then the introductory signal $\text{---} \bullet \bullet \bullet$ followed by own call signal, repeated three times.

(iii) When the signalled party replies, he must send the "begin communication" signal $\text{---} \bullet \bullet \bullet \text{---}$ followed by the signalling party's call signal repeated three times, then the introductory signal $\text{---} \bullet \bullet \bullet$ followed by his own call signal and the "clear for transmission" signal $\text{---} \bullet \bullet \text{---}$. This applies also in the case of a reply to the call under provision vi.

(iv) When there is no reply from the signalled party to the call made under provision ii, repeat the signals in proper order three times at intervals of two minutes. If there is still no reply, allow fifteen minutes to elapse, then make the call again in the same manner.

(v) When communicating with the signalled party by means of the international shipping signals, continue the call by sending the international shipping signal PRB.

(vi) When wishing to detect a wireless message within own range, use the "Inquiry signal" $\text{---} \bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$ and make the call provided under (ii).

(vii) When the signalled party replies, begin the required message immediately, and at its ending send the "end communication" signal $\bullet \text{---} \bullet \text{---} \bullet \text{---}$ and own call signal, followed by the "clear for transmission" signal $\text{---} \bullet \bullet \text{---}$.

(viii) When the signalled party has comprehended the message, he must immediately signify its receipt by sending the signal "understand communication" $\text{---} \bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$.

(ix) When mutual messages have been completed, both parties must exchange the "finished" signal $\bullet \bullet \bullet \text{---} \bullet \bullet \text{---}$ and their own call signals.

(x) When in the case of an experimental message sent out by a wireless telegraph established in accordance with clause v, Article 2, of the Wireless Telegraph Law the call signal of another party is not required, repeat own call signal three times and after ascertaining that there is no danger of hindering another message, begin the required communication, and at its ending send the "end of message" signal $\bullet \text{---} \bullet \text{---} \bullet \text{---}$ and own call signal. Provided that such communication must not exceed twenty minutes in duration.

ART. 22.—When dispatching a signal of distress at sea by private wireless telegraph, the preliminary "ship in danger" signal, $\bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$ should be repeated at frequent intervals according to circumstances followed by the name of vessel in distress, position, and details of conditions and other matters likely to facilitate rescue. If it is desired to get into touch with a specified wireless telegraph a continued series of the "ship in danger" signal $\bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$ should be followed by the call signal of the station signalled.

ART. 23.—When a private wireless telegraph detects the "ship in danger" signal $\bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$ accompanying a message of distress at sea, it must suspend all other messages and immediately reply, and report details in the order specified in the last Article to another wireless telegraph situated at the most convenient point for purposes of rescue. Provided that where the message of distress includes a request for specified action before transmitting the report or for specified items to be included therein, such request must be complied with.

In the case of a continued series of the "ship in danger" signal $\bullet \bullet \bullet \text{---} \bullet \bullet \bullet \text{---}$ being followed by the call signal of a specified station, only in the event of no reply being received therefrom should the responsive steps be taken prescribed in the last paragraph.

ART. 24.—When sending out by private wireless telegraph a necessary warning of danger to navigation, repeat the preliminary navigation alarm signal TTT ten times at short intervals, then transmit necessary details, after which, allowing an interval of ten minutes to elapse, repeat the alarm three times. When a private wireless telegraph detects the navigation alarm signal TTT accompanying a necessary warning of danger to navigation, it must suspend all other messages.

ART. 25.—A private wireless telegraph shall not be prevented in cases of messages coming under the provisions of the last three Articles only, from exceeding the prescribed limit of electric power or wavelength used. Provided that, immediately after such use, the prescribed limits shall be reverted to.

ART. 26.—When a telegraph office has sent out by wireless telegraphy the private "suspend communication" signal $\text{---} \bullet \bullet \bullet \text{---}$ all private wireless telegraph messages within such office's range of distance must be suspended until the private "renew communication" signal $\bullet \text{---} \bullet \text{---} \bullet \text{---}$ is issued.

ART. 27.—A private wireless telegraph shall not be prevented, in the cases referred to below, from operating outside the objects for which it was established.

(i) When deemed necessary to exchange messages with other wireless telegraphs concerning communications coming within the purview of Articles 22 to 24.

(ii) When deemed necessary to exchange messages with other wireless telegraphs in connection with meteorological and time signals or the adjustment of apparatus.

(iii) When rendered necessary to communicate with a telegraph office equipped with wireless telegraph apparatus, following instructions issued by such office.

(iv) When deemed necessary to exchange messages with military wireless telegraphs to meet the requirements of military communications.

ART. 28.—When a private wireless telegraph has received a request from another wireless telegraph to exchange messages for the purpose of adjusting apparatus, it shall respond thereto, provided there is no danger of obstruction.

ART. 29.—The Minister of Communications shall specially instruct the Wireless Telegraph Inspection Bureau to test a private wireless telegraph with a view to ascertaining whether it is properly employed and whether its communications are in order.

ART. 30.—When sending instructions to a private wireless telegraph relating to its communications, the Wireless Telegraph Inspection Bureau will prefix to its call signal the wireless telegraph inspecting signal •—••••• in order to distinguish its message from general communications.

ART. 31.—Where an order is sent direct to an operator relating to the restriction or suspension of operations by the private wireless telegraph operated by him or the removal of its apparatus and accessories, the person responsible for the installation will be separately notified.

ART. 32.—When a vessel with a private wireless telegraph on board comes within the wireless telegraph range of a telegraph office it must briefly report to such office its direction and distance therefrom, together with the direction in which the vessel is moving. When about to withdraw from the range of such office a similar report must be sent.

ART. 33.—The person responsible for a private wireless telegraph must report to the Minister of Communications, at the same time giving details, on all circumstances falling under the following headings :—

(i) When special restrictions have been imposed on the equipment and operation of the wireless telegraph concerned in foreign waters. Provided that exception be made where such restriction has been officially announced.

(ii) When messages have been sent in accordance with Articles 22-24.

(iii) When cases of contravention of the Wireless Telegraph Law or the Regulations connected therewith on the part of a private or foreign wireless telegraph have been detected.

(iv) When matters have arisen calling for special attention in regard to the results of wireless telegraphy or other features.

ART. 34.—The person responsible for a private wireless telegraph must keep a journal and cause the operator to record therein the items coming under the following headings :—

(i) Time of beginning and end of messages, and wireless station signalled.

(ii) Nature of message.

(iii) The circumstances coming under Articles 27 and 33, and the steps taken in accordance therewith.

(iv) In the case of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, the results of experiments.

(v) In addition to the matters under the above headings, references for future use.

Communication journals as prescribed in this Article must be preserved for fifteen months, counting from the month following that in which they are completed.

ART. 35.—The person responsible for a private wireless telegraph must affix in his operating room, where they can easily be seen, his certificate, together with copies of the penal clauses of the Wireless Telegraph Law and a list of the essential objects for which the installation was established.

ART. 36.—The Minister of Communications will from time to time specially send officials to examine reports, and documents connected therewith, on the apparatus mounting and operations of private wireless telegraphs, in such cases the officials concerned will carry proof of their competency.

ART. 37.—Documents to be sent in under the provisions of Articles 7, 8, 10 and 19 may be replaced by telegrams.

ART. 38.—Documents to be submitted under this Ordinance to the Minister of Communications, with the exception of those coming under the preceding Article, must all be passed through the Communications Office having jurisdiction over, or the head post office dealing with branch administrative business at, the place of a land installation or the regular port of mooring of a vessel having an installation.

Supplementary Regulations.

ART. 39.—The provisions of Articles 1 to 3, 5 to 14, 18 to 20, 22 to 38, apply to private wireless telephones, and the provisions of Articles 22 to 24, 26, 29 to 31 and 36 apply to wireless telegraphs or telephones installed on foreign vessels.

ART. 40.—This Ordinance comes into force on November 1st, 1915.

REGULATIONS RELATING TO QUALIFYING EXAMINATIONS FOR OPERATORS OF PRIVATE WIRELESS TELEGRAPHS.

E (Ordinance No. 48, of the Department of Communications, October 26th, 1915.)

ART. 1.—Persons aged seventeen or above qualifying for posts as operators of private wireless telegraphs will be examined and approved according to the following classification :—

Class I.—Persons capable of operating private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2.

Class II.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2 (except those set up under clause iii) and of private wireless telegraphs set up under the provisions of clause iii of the same Article.

Class III.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2, clause v, and of private wireless telegraphs set up under the provisions of any one of the clauses of the same Article.

ART. 2.—Examinations will be carried out by the Qualifying Examination Committee for Operators of Private Wireless Telegraphs appointed by the Minister of Communications. The subjects for examination are as follows:—

(1) Wireless Telegraphy: Theory (for Class I only), adjustment and use of apparatus (for Classes I and II only).

(2) Practical Electric Telegraphy: Transmission of a message in Japanese and a European language and reception of a message by sounder. Standard of speed to be—for Class I, eighty *katakana* characters (syllables) or twenty European words per minute; and for Classes II and III, fifty *katakana* characters (syllables) or twelve European words per minute.

(3) Wireless Telegraph Laws and Regulations: General Laws and Ordinances relating to wireless telegraphs (for Classes I and II only); Laws and Ordinances relating to private wireless telegraphs (for Class III only).

(4) English language: Rudiments (for Classes I and II only).

ART. 3.—The Minister of Communications will award certificates of proficiency (Form No. 1) to successful candidates in the examination.

ART. 4.—Persons who have had not less than two years' practical experience in the public telegraph or wireless telegraph service or in military wireless telegraphy may be granted certificates of proficiency according to the following classification without undergoing examination on review by the Qualifying Examination Committee for Operators of Private Wireless Telegraphs.

(1) Persons engaged in the public wireless telegraph service—for Class I or lower.

(2) Persons engaged in military wireless telegraphy—for Class II or lower.

(3) Persons engaged in the public telegraph service—for Class III.

These provisions apply also in the case of persons holding second or third-class certificates of proficiency according to the following classification:

(1) Persons holding second-class certificates of proficiency who have been engaged for not less than two years as assistant operators of private wireless telegraphs established in accordance with the Wireless Telegraph Law, Article 2, clause iii—for Class I.

(2) Persons holding third-class certificates of proficiency who have been engaged for not less than two years as assistant operators of private wireless telegraphs—for Class II.

ART. 5.—Persons holding a certificate of study for completion of training in wireless telegraphy, practical electric telegraphy, and Wireless Telegraph Laws, and Regulations, in accordance with the classifications determined by the Ministry of Communications, with the object of engaging in wireless telegraphy, may be granted certificates of proficiency, for Class I or lower, on review.

ART. 6.—Examinations will be held annually, date, place and other details thereof will be announced in the *Official Gazette*. Provided that if deemed necessary by the Minister of Communications extra examinations may be held at special times.

Reviews by the examiners will take place according to circumstances.

ART. 7.—Candidates for examination must submit to the Minister of Communications before the appointed date an application in

writing (Form No. 2), appending thereto a statement of antecedents (Form No. 3), an abstract of the Census Register, and a photograph.

ART. 8.—Candidates for examination must pay an examination fee of two yen in Class I and one yen in Classes II and III, affixing to the application form a revenue stamp for the amount.

Fees already paid for examination cannot be refunded to candidates failing to pass the examination or to those disqualified under the provisions of Article 9.

ART. 9.—Where the Qualifying Examination Committee for Operators of Private Wireless Telegraphs have detected false statements in a form of antecedents or improper behaviour during examination, they will disqualify the candidate concerned.

Where the facts of a case coming under the provision of this Article are discovered after the candidate has passed the examination, his certificate of proficiency will be invalidated.

ART. 10.—The names of successful candidates will be announced in the *Official Gazette*.

ART. 11.—Where the holder of a certificate of proficiency has changed his name or lost or damaged his certificate, he may apply to the Minister of Communications for a revision or renewal thereof.

Applicants under this provision must pay a fee of thirty sen for revision or renewal of certificate affixing to the letter of application a revenue stamp for the amount.

Additional Regulation.

This Ordinance comes into force on November 1st, 1915. (Form No. 1.)

Certificate of Proficiency awarded on Qualifying Examination for Operators of Private Wireless Telegraphs.

Name

Address

Date of Birth

Eligible for Class No.

This is to certify that the above-named is qualified in the class designated in accordance with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

Name (seal)

President of Qualifying Examination Committee for Operators of Private Wireless Telegraphs.

Date

The certification of the President of the Qualifying Examination Committee for Operators of Private Wireless Telegraphs is sanctioned and a certificate of proficiency hereby granted.

(This certificate of proficiency falls within the category of Class A (B) certificates under the Business annexed to the International Wireless Telegraph Convention of London, and the holder of this certificate declares his acceptance of the obligation strictly to preserve the secrecy or communications under the whole of the Regulations.)

(Seal) Minister of Communications.

Date

Notes:—

(1) On the back, in the cases of Classes I and II, appears a translation in a foreign language.

(2) The paragraph in parentheses appears in the cases of Classes I and II.

(Form No. 2.)

Memorandum (on Mino paper.)

Form of application for Qualifying Examination for Operators of Private Wireless Telegraphs.

Affix
Revenue
Stamp
here.

Name of applicant
Address
Date of Birth
Class qualifying for : No.....

I am desirous of undergoing
{ examination to }
{ review by examiners to } qualify for the
above Class in accordance with
{ the provisions of the } Regulations relating
{ Article 4 (or 5) of the } to Qualifying Examinations for Operators of
Private Wireless Telegraphs, and append the
documents required by Article 7 of the same
Regulations.

Name (seal)
Present address
Date

To the Minister of Communications.

(Form No. 3.)

Memorandum (on Mino paper.)

Statement of Antecedents.

Name
Social status and domicile
Date of birth
Education :—
School Section Date of
entry

School Section Date of
completion of studies, graduation, or
leaving school (abstract of
graduation certificate or certificate of
study appended).

Occupation :—

Government office or private firm (fill in
name) Date of entry Occupa-
tion followed (references from the Govern-
ment office [or firm] appended)

Awards or penalties :—

Description Date

The above is a correct statement.

Name (seal)
Present address
Date

Note.—A detailed statement of matters relating
to telegraphy or wireless telegraphy is required.
Attention is directed to the following points :

- (1) The applicant's name must be inscribed
on the photograph.
- (2) The revenue stamp must not be
cancelled.

REGULATIONS REGARDING THE QUALIFICATIONS OF WIRELESS OPERATORS.

F The following Regulations regarding
the qualifications of wireless operators
have been issued from the Department
of Communications :—

- (i) Substitution of Foreign Operators.
- (ii) Qualification of Wireless Operators
on Fishing Trawlers.

- (iii) Amendment to the Regulations regard-
ing Qualifying Examination for
Operators of Private Wireless Tele-
graphs.

I.—FOREIGN OPERATORS MAY BE SUBSTITUTED.

In order to prepare against possible instances
where wireless operators on board Japanese
ships for the service to foreign ports will be
unable to attend their duties because of sickness
and other inevitable circumstances, 1st and 2nd
class foreign operators having certificate for
the licence of A or B category may be employed
as substitutes to Japanese operators, subject
to the approval of the Minister of Communica-
tions, in consequence of the putting the com-
pulsory wireless regulations into effect in
England. In case of application for the employ-
ment of foreign operators under the foregoing
paragraph certificates will be given them by
the Ministry of Communications. Aboard ships
employing foreign operators an office for public
communications in foreign languages may be
opened.

II.—QUALIFICATION OF WIRELESS OPERATORS ON FISHING TRAWLERS.

In view of the fact that the wireless equipment
aboard fishing trawlers will not only facilitate
the safety of their voyage and immediate relief
from accidents, but will also be a great advant-
age for the fishing industry by signalling the
presence of swarms of fish and other discoveries
to companion ships, it is no longer uncommon
for trawlers and smaller crafts to be equipped
with wireless apparatus. Hitherto, however,
only 1st class operators have been admitted
to engage in the wireless service on these ships
which has proved to be quite inadequate. The
regulations are now amended to the effect that
2nd class operators will henceforth be admitted
as senior operators on the ships carrying on the
wireless service in Japanese language. In view
of the actual importance, certificate of the
licence as 2nd class operator will be granted by
the Ministry of Communications to those having
practical experience in wireless communications
in the Navy and other establishments.

III.—AMENDMENT TO THE REGULATIONS REGARDING QUALIFYING EXAMINATION AS WIRELESS OPERATORS FOR PRIVATE ESTAB- LISHMENTS.

In view of the growing increase of applicants
for the licence as wireless operators in private
establishments, the Regulations regarding the
qualifying examination are amended as follows :

- (a) Instead of the names of applicants, their
number will be written in examination papers.
- (b) The result of the examination will be
announced in each subject on the day of its
examination for the purpose of selection and
dispensing with further trouble with the rest
of the examination.
- (c) Wireless experts in the Army and Navy
will also be included in the examining com-
mittee.

KENYA COLONY AND PROTECTORATE.

(See Maps 25 and 28)

THE administration is conducted by a Governor and Commander-in-
Chief, assisted by an Executive and a Legislative Council.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
The Hon. Mr. T. Fitzgerald.	Postmaster-General	Nairobi.

ORGANISATION.

At present there are two radio stations open for public traffic in this territory—one at Mombasa and the other at Kisimayu, in Jubaland.

A radio service is maintained with Mombasa as a means of communication with Jubaland.

Licences have, so far, only been issued in respect of some half dozen experimental receiving stations and only three of these latter are now being actually worked.

ADMINISTRATION.

Radiotelegraphy is administered under the following:—

A—Wireless Telegraphy Ordinance, 1913.

B—Experimental Licence issued thereunder.

WIRELESS TELEGRAPHY ORDINANCE, 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. The expression "wireless telegraphy" means any system of communication by telegraph as defined by the Indian Telegraph Act, 1883, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand and five hundred rupees or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor may make regulations for all or any of the following matters:—

(i) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) For prescribing the fees payable on the grant of any licence;

(iii) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Protectorate shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the Protectorate or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) For prohibiting, except with the special or general permission of the Postmaster-General of the Protectorate, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Protectorate;

(v) For prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Protectorate, the use of wireless telegraphy on board such ships while in such water by

such further rules as the Governor may see fit to make from time to time and either in all classes or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any Regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of seven hundred and fifty rupees.

(2) All convictions, forfeitures, and fines under this Ordinance or any Regulations thereunder may be had and recovered before a Magistrate of the first class, and every such Magistrate shall have jurisdiction to pass any sentence authorised by this Ordinance on any European or other non-native convicted of an offence against this Ordinance notwithstanding anything in any Ordinance or law limiting the jurisdiction of such Magistrate over Europeans and non-Natives.

9. The Wireless Telegraph Ordinance, 1908, is hereby repealed:— Provided however—

(1) Every licence granted under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been granted under this Ordinance.

(2) All Regulations made under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been made under this Ordinance and shall continue in force until other provision is made.

LICENCE.

B In exercise of the powers conferred upon me by Section 7 of the Wireless Telegraphy Ordinance, 1923, I, Robert Thorne Coryndon, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief of the Colony and Protectorate of Kenya, do hereby licence and authorise..... residing at..... to conduct experiments in wireless telegraphy, and for such purpose to import wireless telegraph apparatus and install the same at such places as the Postmaster-General shall approve, subject to the conditions and restrictions following, that is to say :—

1. All apparatus utilised pursuant to the provisions of this licence shall be used solely for the purpose of scientific study in wireless telegraphy and in no case shall the licensee instal apparatus capable of being used for the purpose of sending wireless signals, or use the receiving apparatus for the purpose of receiving either private messages or for any commercial telegraph traffic whatsoever.

2. This licence shall remain in full force and operation for..... from date hereof.

Given under my hand at Nairobi this .. day of .. 192 ..

Governor and Commander-in-Chief.

LATVIA

(See also Maps 3 and 9)

LATVIA, one of the new Baltic States, proclaimed her independence (from Russia) on November 18th, 1918, which was recognised “*de jure*” by the Supreme Council on January 26th, 1921; and the new state was admitted to the League of Nations on September 22nd, 1921.

The Government of Latvia, according to the Constitution of 1922, is republican, representative and democratic. It is composed of the Legislature, the Executive and the Judicature. The Legislature is the National Assembly (“*Saeima*”), and the Executive are the President of the Republic and the Cabinet of Ministers.

CONTROL.

The control of wireless telegraph operations, except military and naval stations, is in the hands of the Director-General of Posts and Telegraphs, assisted by the Central Wireless Section of the Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eduards Kadikis	Director-General of Posts and Telegraphs	Riga
Janis Linters	Chief of Central Wireless Section..	Riga

ORGANISATION.

At the present time the following wireless stations are in operation :—

Coast Stations (P.G.)	..	..	..	..	2
Coast Stations (Official)	..	..	..	..	1
Long Distance Fixed Station	..	..	..	..	1
Ship Stations (Commercial)	..	..	..	..	13
Central Receiving Station	..	..	..	..	1

There are no direction finding stations, no amateur or radio clubs and no amateur licences. There are seven private receiving stations for time and meteorological signals and two schools—one for military and the other for private operators.

ADMINISTRATION.

Latvia was admitted to the International Radiotelegraphic Convention on January 1st, 1922.

- A**—Law relating to the Establishment and use of Radio Stations.
- B**—Regulations for Merchant Ships.
- C**—Regulations for the Examination of Latvian Commercial Radio Operators.
- D**—Form of Licence for the Installation of Wireless Apparatus on board ship.
- E**—Form of Licence for Operating Wireless Apparatus on board ship.
- F**—Form of Certificate of Proficiency in Radiotelegraphy.

LAW UPON THE ESTABLISHMENT OF RADIO STATIONS AND UPON MAKING USE OF THEM.

A 1. All radio stations on the territory of Latvia and on board ships and aeroplanes sailing under the flag of Latvia are managed by the State or subjected to the control and inspection of the Government.

NOTE 1.

As radio stations are considered all telegraphs, telephones or other apparatus of this nature, inter-communicating or sending out or exchanging signals by means of electromagnetic waves.

NOTE 2.

The territory of Latvia is considered the whole land territory of Latvia, the territorial waters of Latvia and the air over these territories.

NOTE 3.

The officials empowered by the Director-General of Posts and Telegraphs have the right to control all radio stations on board foreign ships coming into the territory of Latvia, to examine their certificates, licences and installations, and to ensure the observation of all Radiotelegraph International and Latvian regulations, both general and local, by that radio station.

2. No private person, corporation or Government institution in Latvia, on Latvian ships or aeroplanes, excepting the Ministry of Communications and the Ministry of War, has the right, without previous permission given by the Director-General of Posts and Telegraphs, to manufacture, provide, keep, establish or use radiotelegraphic or radiotelephonic stations, apparatus or parts.

3. The Director-General of Posts and Telegraphs may issue—in conformity with the present law and the 1912 London Radiotelegraphic Convention and other international treaties, already concluded or which will further be concluded,—detailed regulations for the use of all radio stations in Latvian territory excepting stations controlled by the Ministry of War. These regulations must be confirmed by the Minister of Communication.

4. In order to guarantee secrecy of correspondence or for the security of the State the Minister of Communication independently or at the request of the Minister of War is entitled to revoke, without explanation of the reasons, the permissions given or to close private radio stations. The owners must remove the apparatus and accessories installed in the time fixed by the Director-General of Posts and Telegraphs, failing which the Director-General of Posts and Telegraphs will do so at the expense of the owners.

Note.—All radio stations excepted those belonging to the Ministries of War or of Communications are considered private stations.

5. In case of war or on the proclamation of the state of siege, the Director-General of Posts and Telegraphs is entitled upon request of the Minister of War to close all private radio stations on land, on board ship or on aeroplanes, or to put them under the control of the Ministries of Communication or of War. In such cases all private radio stations, apparatus and parts may be legally requisitioned for the use of these branches of Administration.

6. The mutual relations in radiotelegraphic questions between the Ministries of War and of Communications and the stations belonging to them (including private stations under the management or control of the Director-General of Posts and Telegraphs) are regulated by joint committees of these branches of Administration, their decisions have to be confirmed by the Ministers of War and of Communications. In case of dissent between the Ministers of War and of Communications the Cabinet of Ministers decides the question.

7. The stations belonging to the Ministry of War must observe the International Radio Convention and general telegraphic regulations, when transmitting signals of danger or warning, in communications with foreign states or exchanging general public correspondence.

8. To provide for the safety of navigation (on sea and in the air) the Minister of Communications, in agreement with the Ministers of War and of Foreign Affairs and, in conformity with the international treaties and conventions, may issue regulations for the compulsory fitting and the use of radio stations on Latvian vessels of different tonnage and type.

9. In cases of contravention of Article 2 of this law or the ordinances and regulations based on Articles 3 and 8 of the same law, the Minister of Communications is entitled to retract the permissions given and to close the stations. The transgressor may be sentenced by the Criminal Court to imprisonment (Penal Code, Article 20), or to a fine of 100-2,500 francs, or the two punishments jointly, and the Court has the right to confiscate all the radio stations, apparatus and accessories in his possession. If a person belonging to the crew of a vessel or aeroplane becomes liable for punishment, he is not allowed to leave the Latvian territory until he has deposited a security in currency.

10. This law annuls the regulation of October 28th, 1922 (the Governments News 1922, No. 247) concerning the installation and use of radio stations.

*Signed: J. ČAKSTE,
President of the State.*

Riga, June 4th, 1923.

EXTRACT FROM MERCHANT SHIPS WIRELESS REGULATIONS.

B 1. No shipboard wireless station on a Latvian merchant ship shall be established or operated without a licence issued by the Director-General of Posts and Telegraphs of Latvia.

2. Firstly the shipowner requests permission to provide and establish a wireless station. Secondly the shipowner informs the Director-General of the accomplished installation, how he intends to operate it, the hours of service, wavelength, etc., and requests a licence for operating.

3. If the station fulfils all prescriptions of the radiotelegraphic regulations the Director-General delivers the requested licence. This licence is to be produced anywhere at Latvian or foreign ports on request by the wireless inspectors of these ports.

4. The Director-General determines the international call signal and takes steps to ensure that the name of the ship station is incorporated in the international list of the world's wireless stations.

5. The shipboard station and operators shall fulfil all prescriptions of the Radiotelegraphic Convention, 1912. In case of contravention they are liable to punishment, and their licences and certificates annulled.

6. The Latvian shipboard wireless stations charges are determined by the Director-General.

*(Signed) ED. KADIKIS,
Director-General.*

J. LINTERS.

Chief of Central Wireless Section.

Confirmed by the Minister of Communications,
Riga, March 30th, 1922.

EXTRACT FROM THE REGULATIONS FOR THE EXAMINATION OF LATVIAN COMMERCIAL RADIO OPERATORS.

C In conformity with Art. 10 of the London Radio Telegraphic Convention of July 5th, 1912, I publish the following decree:—

1. Situations on Latvian merchant ships are available only to radio operators

who have a certificate issued by the Director-General.

2. This certificate will be delivered after an examination and after the applicant has signed a declaration that he will keep secret all radio-telegraphic correspondence.

3. Every radio operator may be re-examined should the progress in radiotelegraphy demand it. The certificate may be given for a determined time.

4. In special cases, aliens can obtain certificates as radio operators on board Latvian ships, for a short period only.

Riga, March 30th, 1922.

*(Signed) ED. KADIKIS,
Director-General.*

LICENCE FOR THE INSTALLATION OF A SHIPBOARD WIRELESS STATION.

.....STEAMSHIP CO., LTD.

D You are hereby authorised to acquire for your ship "....." gross and net R.T. a wireless telegraph shipboard station of a size that conforms to the regulations of those countries which your ship is to visit, and to install the station on board the ship.

The installation will be tested and certified at the ships next arrival at Riga. For shipboard wireless station the call signal "....." has been reserved.

Riga,th, 1922.

(Signed)

Director-General.

of Posts and Telegraphs of Latvia.

Chief of Wireless Section.

LICENCE.

E In conformity with the regulations of the International Radiotelegraphic Convention, London, 1912, by these presents it is permitted to open for communication the radiotelegraphic station, installed with my permission on board the Latvian ss. "....." belonging to the port of Riga.

The Latvian Post and Telegraph Administration certifies that the station mentioned as deceeded below fulfils all the conditions cited in conformity with the International Radiotelegraphic Convention and has been registered relative to this service as shipboard station of the third Class.

Riga, 1922.

(Signed)

Director-General

of Posts and Telegraphs of Latvia.

SCHEDULE OF STATION AND APPARATUS.

1. Ship, Steamer.
2. Registered tons, gross and average speed.
3. Owner.
4. Home port.
5. International Code letters.
6. Radio call letters.
7. Nature of service.
8. Hours of operation.
9. Class.
10. Ship charge:
 - With Latvian coast or shipboard stations, 05 centimes per word.
 - With foreign coast or shipboard stations, 15 centimes per word.
11. Normal day range in nautical miles with other ship at sea.
12. System.
13. Power:
 - Transformer input.
 - Primary source of power.
 - Direct current generator,

CONVENTION.

A Concluded between the Swiss Federal Council and the Government of the Principality of Liechtenstein relating to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

Concluded on the 10th of November, 1920.

Brought into operation on the 1st of February, 1921.

THE FEDERAL COUNCIL OF THE SWISS CONFEDERATION.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification, between the plenipotentiary of the Federal Council, in the name of the Swiss Confederation, and that of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality, with regard to the exploitation of the postal, telegraphic and telephonic services of the Principality of Liechtenstein in the hands of the administration of Swiss telegraphs and telephones, which Convention was approved by the States Council on the 10th December, 1920, and by the National Council on the 17th day of the same month, and of which the following is the text.

THE GOVERNMENT OF THE PRINCIPALITY OF LIECHTENSTEIN.

After having seen and examined the Convention concluded at Berne on the 10th November, 1920, under reservation of ratification between the plenipotentiary of His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the name of the Principality and that of the Federal Council, in the name of the Swiss Confederation with regard to the exploitation of the postal, telegraphic and telephonic services of the Principality of Liechtenstein in the hands of the administration of Swiss posts and the administration of the Swiss telegraph and telephones, which Convention was approved by the assembly of Liechtenstein on the 29th of December, 1920, and which runs as follows—

The Swiss Federal Council and His Serene Highness, the reigning Prince of the Principality of Liechtenstein, in the traditional spirit of good neighbours, have resolved to conclude a Convention in order to assure the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein in the hands of the administration of the Swiss posts, telegraphs and telephones, and have appointed their plenipotentiaries to this effect, viz.:—

The Swiss Federal Council, M. Guiseppe Motta (doctor of laws), President of the Swiss Confederation, Chief of Federal Political Department, H.S.H. the reigning Prince of the Principality of Liechtenstein, M. Emile Beck (doctor of laws), Charge d'Affaires of the Principality of Liechtenstein, in Switzerland, who, having presented their full powers, recognised in proper and due form, arranged the following provisions.

CHAPTER I.

GENERAL PROVISIONS.

ART. 1.—The postal service, including the postal cheque service and that of the postal savings bank, as also the telegraphic and telephone services of the Principality of Liechtenstein, are exploited for the Principality by the care of the management of the Swiss posts and the management of the Swiss telegraphs and telephones.

ART. 2.—The Swiss rules and regulations having reference to the postal, telegraphic and

telephone service, as well as the agreements and statements concluded between Switzerland and foreign countries, are applicable in the Principality of Liechtenstein in the same way as in Switzerland.

ART. 3.—Inasmuch as their repression is foreseen in the law, the contraventions of the federal fiscal laws are deferred, in the first instance, to the tribunal at Vaduz.

The cantonal tribunal of St. Gall is appointed as a court of appeal, and the federal tribunal at Lausanne as supreme court of appeal.

ART. 4.—(1) The post, telegraph and telephone offices of the Principality of Liechtenstein must be appointed as such, although they depend exclusively upon the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones.

(2) Only the armorial bearings and national colours of the Principality will figure on notices, stamps and official seals of the post, telegraph and telephone offices of the Principality.

(3) The employees of Liechtenstein nationality engaged in the Principality are required to furnish their caps with the Liechtenstein badge, and the wearing of this cap is compulsory.

CHAPTER II.

POSTAGE STAMPS, TAXES AND DUES.

ART. 5.—(1) (Concerning postage stamps.)

(2) (Concerning the sale of postage stamps.)

(3) (Concerning forgeries of postage stamps.)

ART. 6.—(1) The same taxes and dues will be gathered in the postal, telegraphic and telephone traffic between Switzerland and Liechtenstein as in the Swiss interior traffic. In that which concerns the postal, telegraphic and telephone traffic between the Principality of Liechtenstein and abroad the tariffs are the same as those applied by Switzerland in her traffic with abroad.

(2) The right of freedom from tax in the Principality is regulated by the same decrees as in Switzerland.

CHAPTER III.

SERVICE OF OFFICIALS AND EMPLOYEES.

ART. 7.—(1) The officials and employees of the postal, telegraphic and telephone services of the Principality of Liechtenstein are engaged by the administration of the Swiss posts and the administration of the Swiss telegraphs and telephones. The Government of the Principality of Liechtenstein has always the right to make proposals for the definite nomination of officials. Except on account of special reasons touching on questions of service, these proposals shall be adopted.

(2) Provisionally, and in so far as the necessities of the service exact it, officials and employees of Swiss nationality may be equally employed in the Principality.

ART. 8.—(1) The officials and employees of the postal, telegraphic and telephonic service of the Principality of Liechtenstein have the same rights and duties as the similar staff engaged in Switzerland.

(2) The authorities, tribunals and district presidents of the Principality of Liechtenstein shall assist this staff in the exercise of its duties in the same degree as the similar authorities in Switzerland.

(3) If an enquiry is held on, or a judgment given against, an official or employee of the postal, telegraphic or telephone service of the Principality, the local tribunals are under the obligation of enforcing the authority to which the accused belongs in the same manner as the Swiss tribunals have to do in like case in Switzerland.

CHAPTER IV.

POSTAL ROUNDS AND TECHNICAL INSTALLATIONS.

ART. 9.—The establishment and suppression of post, telegraph and telephone offices, the establishment, modification and suppression of postal rounds, as well as telegraphic and telephonic installations in the Principality of Liechtenstein, can only be ordered after an understanding with the Government of this State. The demands formulated on this subject by the Government of Liechtenstein will be taken into consideration, as far as possible, by the Swiss administration as far as it refers to installations the expenses of which are borne by the same Government.

CHAPTER V.

POSTAL CHEQUE AND POSTAL SAVINGS BANK SERVICES.

ART. 10.—(1) (Concerning the Post Office Savings Bank.)

(2) (Concerning the accounts of the Post Office Savings Bank.)

ART. 11.—(Concerning the investment of funds.)

CHAPTER VI.

OWNERSHIP OF THE FUNDS.

ART. 12.—(1) (Concerning the exploitation of funds.)

(2) (Concerning the exploitation of funds.)

ART. 13.—(1) The equipment of the offices and of the staff, as well as of the telegraphic and telephonic installations necessary to assure the exploitation of the postal, telegraphic and telephone services on the territory of Liechtenstein, are the property of the Principality of Liechtenstein.

(2) All acquisitions and installations effectuated under the regime of the present Convention are done at the cost of the Principality of Liechtenstein, and become its property.

CHAPTER VII.

SETTLEMENT OF ACCOUNTS.

ART. 14.—(1) The receipts and expenses accounts of the postal service of the one part, and those of the telegraphic and telephone service of the other part are settled separately.

(2) They are made up each month by the Swiss administration concerned, and an abstract is sent to the Government of the Principality of Liechtenstein, which must give its opinion in the course of one month. It is allowed that these monthly accounts can be followed by supplementary abstracts of accounts.

ART. 15.—(1) All expenses incurred by the postal, telegraphic and telephone services of the Principality must pass through the accounts in such a manner that only such sums which have been actually spent are mentioned.

(2) The annual expenses occasioned by the general administration (management, superintendence, auditing of accounts, etc.), as well as the purchase of office stock for current use (forms, etc.), are carried to the debit side of the exploitation account at a round figure corresponding approximately to the needs of Liechtenstein.

ART. 16.—(1) All taxes and dues collected in the postal service by the post offices of Liechtenstein accrue exclusively to the Principality of Liechtenstein, and the sum total of these emoluments must, in consequence, be paid into the credit of the exploitation account. On the other hand, the receipts realised by the Swiss offices and arising from the collection of the same, taxes and dues accrue exclusively to Switzerland, and do not affect the accounts in question.

(2) At the same time, the receipts coming from the Liechtenstein postage stamps, which are sold to collectors through the offices specially reserved for this purpose by the Government of the Principality, must not figure in the above-mentioned accounts.

(3) In the telegraphic and telephonic traffic between Switzerland and Liechtenstein, the taxes and dues are also deducted for the profit of the country in which they are collected.

ART. 17.—(1) There is no rebate made with Liechtenstein on the subject of postal traffic between Switzerland and a third country. With what concerns the postal traffic between Liechtenstein and other States, such an allowance will not be necessary as long as the traffic remains about as intense in one sense as another.

(2) In the telegraphic and telephonic working between Liechtenstein and other countries, Liechtenstein receives such portion of the dues accruing to Switzerland from the outgoing traffic. With what concerns the incoming traffic between Liechtenstein and other countries the terminal tax is collected for the benefit of the State.

(3) Each of the contracting parties renounce the right of crediting their accounts with the dues from the transit in the postal, telegraphic and telephonic traffic between Switzerland and Liechtenstein.

ART. 18.—(1) The receipts accruing from the exploitation of the postal, telegraphic and telephone services in the Principality of Liechtenstein are primarily directed to cover the expenses of such exploitation. If the exploitation account shows a credit balance, such becomes the property of the Principality of Liechtenstein. A debit balance is charged to the account of the latter. It will, in addition, have to bear the expenses entailed by all constructions and acquisitions which, according to the opinion of the Swiss administrations, are necessary to the exploitation of the postal, telegraphic and telephone services of the Principality of Liechtenstein.

(2) Once the balance sheet is issued, such credit as acquired by either Switzerland or the Principality of Liechtenstein must be discharged in Swiss currency within a period of 14 days at latest after the acceptance of the accounts.

CHAPTER VIII.

FINAL RESOLUTIONS.

ART. 19.—(1) The present Convention will be ratified and will come into force after the exchange of the documents of ratification. It can be published on the 1st of January or the 1st of July of the civil year, subject to six months' notice.

(2) Modifications can be incorporated in the present Convention by mutual consent without formal announcement.

(3) The Swiss postal administration and the Swiss telegraphic and telephone administration will decree the working arrangements necessary to the present Convention.

ART. 20.—In case of disagreement on the subject of the interpretation of the present Convention, the question in dispute shall be submitted to an arbitration tribunal should it be found impossible to settle the matter by diplomatic means. In this case each of the contracting parties shall choose an arbitrator. If the two arbitrators should not agree they will themselves appoint a referee or umpire.

In testimony whereof, the plenipotentiaries have signed the present Convention and have thereto set their seal.

Executed in duplicate, at Berne, the 10th day of November, 1920.

(L.S.) (Signed) MOTTA.
(L.S.) (Signed) BECK.

Certifies that the above Convention is ratified and has the force of law in all its parts, promising in the name of the Swiss Confederation, to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the President and the Chancellor of the Swiss Confederation, and furnished with the federal seal.

Executed thus, at Berne, on the 28th January, 1921.

In the name of the Swiss Federal Council.

(L.S.) SCHULTHESS.
The President of the Confederation.

(L.S.) STEIGER,
The Chancellor of the Confederation.

Certifies that the above Convention is ratified and has the force of law in all its parts, promising in the names of the Principality of Liechtenstein, to observe it conscientiously at all times in so far as itself is concerned.

In testimony whereof the present ratification has been signed by the head of the Government of the Principality and furnished with the State seal of Liechtenstein.

Executed thus as Vaduz on the 27th of January, 1921.

In the name of the Government of the Principality of Liechtenstein.

(L.S.) DR. JOSEPH PEER,
The Head of the Government.

N.B.—The exchange of the documents of ratification took place at Berne on the 31st of January, 1921, and the Convention, in accordance with the Article 19 above, came into force on the 1st of February, 1921.

MADAGASCAR

(See Maps 25 and 31.)

Including: Mayotte and the Comoro Islands, Réunion.

MADAGASCAR is a French Colony under a Governor-General.

CONTROL AND ORGANISATION.

The radiotelegraphic system is controlled by the Director of Posts and Telegraphs, each station being in the charge of a European Postmaster with a staff of native operators. There are at present six stations in operation. Diego Suarez (8 kW. spark), Nossi Bé, Helville (valve) communicating only with Diego; Majunga, Dzaudzi and Mutsamudu (5 kW.) and a small 1 kW. station at M'Dé on the Island of Grand Comoro.

Stations are projected for Tulear and Tamatave, each of 15 kW. A 2 kW. station will be erected at Sainte-Marie, and probably a 5 kW. station at Manakara will be begun in 1925.

ADMINISTRATION.

The Laws and Regulations are those applicable to French Colonies. (See under France and Algeria.)

MALTA

(See Maps 2 and 13)

Including Gozo.

THE Island forms the headquarters of the British Mediterranean Fleet and the principal coaling station for merchant vessels, as well as the Navy in the Mediterranean. By letters patent dated April 14th, 1921, responsible government was established in Malta. The previously existing Council of Government gave place to a Legislature composed of two Houses—the Senate and Legislative Assembly.

CONTROL AND ORGANISATION.

There are three stations, two belonging to the Navy and one, which is open for public service to ships, belongs to the Eastern Telegraph Company.

ADMINISTRATION.

Wireless telegraphy in the Colony is administered under the provisions of the Wireless Telegraphy Apparatus Ordinance, 1922 and the Merchant Shipping Wireless Telegraphy Ordinance, 1923. Regulations under these

Ordinances have been made by His Excellency the Governor. The Ordinances and Regulations are printed below.

- A**—Ordinance No. II of 1922, The Wireless Telegraphy Apparatus Ordinance, 1922.
- B**—Conditions under which licence may be granted under Article 3 of above Ordinance.
- C**—Ordinance No. I of 1923. The Merchant Shipping Wireless Telegraphy Ordinance, 1923.
- D**—Rules relating to Wireless Telegraphy on Ships.

PLUMER, F. M.,
Governor.
6th June, 1922.

ORDINANCE No. II OF 1922.

A AN ORDINANCE enacted by the Governor of Malta in the exercise of the powers conferred upon him by His Majesty's Letters Patent dated the 14th of April, 1921, constituting the office of Governor and Commander-in-Chief of Malta.

To Control Wireless Telegraphy.

WHEREAS wireless telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient to make a law with regard to the possession of wireless telegraphic apparatus.

Be it enacted by the Governor as follows:—

1. This Ordinance may be cited as "The Wireless Telegraphy Apparatus Ordinance, 1922."

2. No person shall, without the written permission of the Governor, make, buy, sell or have in his possession or under his control, any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus; and no person shall sell or give any such apparatus to any person who has not obtained such permission as aforesaid, and any person having in his possession or under his control any such apparatus, whether with or without the permission of the Governor, shall on demand deliver the apparatus to the Governor or as he may direct, and if any person contravenes the provisions of this article he shall be guilty of an offence against this law.

3. The Governor may annex to any written permission as aforesaid such terms or conditions as he thinks fit and upon the breach of any such terms or conditions the person committing such breach shall be guilty of an offence against this law.

4. For the purpose of this law, any apparatus ordinarily used as a distinctive component part of apparatus for the sending or receiving of messages by wireless telegraphy or telephony shall be deemed to be intended to be so used unless the contrary is proved.

5. A person committing an offence against this law shall, on conviction, be liable to a fine not exceeding £50; and on a second or further conviction, to a fine not exceeding £100, or to imprisonment for a period not exceeding three months, or to both such imprisonment and fine; and on conviction of a first or other offence against this law the Court may, and on the recommendation of the Governor shall, declare the permission given to the person convicted to be cancelled and order the apparatus to be delivered up to the Commissioner of Police.

6. In this Ordinance, "Wireless Telegraphy" means any system of communication by means of electric signals or telephony without the aid

of any wire connecting the points from and at which the messages or communications are sent or received.

Passed 6th June, 1922.

By Command.

ED. R. MIFSUD,
Clerk of the Nominated Council.

B CONDITIONS OF LICENCE GRANTED UNDER ARTICLE 3 OF ORDINANCE No. II OF 1922.

1. This permission may, by order of the Governor, be withdrawn, modified or cancelled at any time without previous notice. Such withdrawal, modification or cancellation shall not give the licensee or any other person whatsoever any claim for compensation, or remuneration for any loss, damage or default, arising therefrom, or any right to know the reason thereof.

2. The apparatus shall be kept at the address mentioned in the licence, and not removed therefrom for any reason without the permission of the Governor.

3. The said apparatus is to be used exclusively for receiving messages in the course of experimental or scientific work, and is not to be used for sending or transmitting any signals, signs, words or messages whatsoever, or for any commercial purpose.

4. The licensee shall observe scrupulously and absolutely the secrecy of all messages intercepted by the said apparatus whether such messages be in connection with any department of His Majesty's Service, or of a private or commercial nature, or a press message, and shall refrain from imparting directly or indirectly to any person any sort of information received by the apparatus or any part of such information, and shall ensure that such information is not conveyed in any way through his act, omission, neglect or default, or that of any person employed by him, or who assists him, or is for any reason present on, or has access to, the premises.

5. If the licensee at any time makes use of thermionic valves in connection with any apparatus possessed by virtue of this licence the receiving circuits of such apparatus shall be so loosely coupled as, in the opinion of the inspecting officer, to prevent interference with the communications of the Imperial Services, Wireless Telegraphy installations in Malta or Gozo.

6. The following wavelengths shall not be used in connection with the said apparatus:—1,300 metres, 1,900 metres, 1,680 metres.

7. The Governor, the Naval, Military or Air Force Authorities, or the Commissioner of Police, or any officer authorised by them or by one of them for that purpose, shall have power to inspect at any time, even without previous notice, the said apparatus in the presence of the licensee or his representative, for the purpose of ascertaining that the conditions of this licence are being observed. For this object any officer authorised as above shall have free access to

the apparatus and to any part of it, and liberty to inspect, examine and use any instrument or device or any part thereof, as well as any books, papers or other materials pertaining to or used in connection with the same. Such officer, however, shall treat as secret and confidential, and shall not make any use whatsoever of any information by him obtained during or by reason of such inspection, except in so far as it is necessary for him to divulge it in the execution of his office or duty.

8. The grant of this permission shall not be held to entail on the Government, the Civil, Naval, Military or Air Force Authorities any responsibility whatsoever for anything done, suffered to be done, or omitted by the licensee or any one employed by him or acting for him, or assisting him, in the use or the working of the said apparatus and through which or by reason of which any liability whatsoever, civil or criminal, is at any time incurred. Nor shall the grant of this permission be held to exonerate the licensee from any such liability as herein mentioned, or in any way to diminish it, or to indemnify him in respect of any act, neglect or omission, which constitutes a breach of any civil or criminal law or regulation in force at any time during the period of the validity of this permission.

9. There shall be payable for the grant of this permission such an annual fee as may be prescribed by regulations issued by the Governor under the Fees (Reserved Matters) Ordinance, 1922. Such fee shall be payable in advance at the office of the Lieutenant-Governor, The Palace, Valletta.

10. This permission is valid for twelve calendar months from the date upon which it is given but without prejudice to the provisions of condition 1 hereof.

PLUMER, F. M.,
Governor.

23rd January, 1923.

ORDINANCE No. I of 1923.

C AN ORDINANCE enacted by the Governor of Malta in the exercise of the powers conferred upon him by His Majesty's Letters Patent, dated the 14th of April, 1921, constituting the Office of Governor and Commander-in-Chief of Malta.

To control Wireless Telegraphy on Ships.

Whereas Wireless Telegraphy is a reserved matter under the provisions of the Malta Constitution Letters Patent, 1921, and it is expedient for the peace, order and good government of Malta that provision be made therefor so far as ships registered in Malta are concerned.

It is enacted by the Governor as follows:

1. This Ordinance may be cited as "The Merchant Shipping Wireless Telegraphy Ordinance, 1923."

2. Every seagoing British ship registered in Malta being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation and a licence to keep and use the same, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the Rules made for the purpose under this Ordinance, and shall be provided with at least one or more certified operators and watchers, in accordance with such Rules.

3. The Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged or other circum-

stances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

4. The Governor shall make Rules prescribing the form and substance of licences to keep and use wireless telegraphy installations, the nature of the wireless telegraph installation to be provided, the services to be maintained, and the number, grade and qualifications of the operators and watchers to be carried, and providing for the examination of operators and watchers in cases where necessary, and for fees payable in respect of such examination. Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

5. A surveyor of ships or a wireless telegraphy inspector appointed by the Governor may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance, and with any Rules from time to time made thereunder, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916. The Governor may by Rule made under this Ordinance prescribe for the payment of a fee for such inspection.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in writing to the Collector of Customs, and any ship which may seek to obtain a clearance or transire shall be detained until a certificate under the hand of any such surveyor or inspector is produced by the Master of the ship to the Collector of Customs to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and with any Rules from time to time made thereunder.

6. If the provisions of the foregoing articles of this Ordinance or of any Rules from time to time made thereunder are not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted before the Court of Magistrates of Judicial Police.

7. The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Merchant Shipping (Convention) Act, 1914.

8. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Malta, apply to ships other than British ships registered in Malta while they are within any port in these Islands in like manner as they apply to British ships so registered.

9. In this Ordinance the expression "passenger steamer" means a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed by the Governor for the purpose mentioned in Section 5 of the Ordinance.

Passed 23rd January, 1923.

By Command.

Edw. R. Mifsud,
Clerk of the Nominated Council.

D In exercise of the powers vested in the Governor by Article 4 of the Merchant Shipping Wireless Telegraphy Ordinance, 1923, His Excellency has been pleased to make the following rules regarding the nature of the wireless installation to be provided on ships, the services to be maintained, and the number, grade and qualifications of the operators and watchers to be carried.

RULES REGARDING THE NATURE OF THE WIRELESS INSTALLATION TO BE PROVIDED, THE SERVICES TO BE MAINTAINED, AND THE NUMBER, GRADE AND QUALIFICATIONS OF THE OPERATORS AND WATCHERS TO BE CARRIED ON MERCHANT SHIPS UNDER THE PROVISIONS OF THE MERCHANT SHIPPING WIRELESS TELEGRAPHY ORDINANCE, 1923.

Interpretation.

1. The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

Classification of Ships.

2. For the purpose of these Rules ships shall be classified as follows:—

Class I. Ships carrying 200 persons or more.

Class II. Ships carrying 50 but less than 200 persons.

Class III. Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

Nature of Installation.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (a) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(b) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(c) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(d) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one and a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a coast station open for general public correspondence when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means, and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

Ships Not Fitted with Approved Automatic Apparatus

7 If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:—

<i>Nature of Voyage.</i>	<i>Number and Grade of Operators.</i>
(a) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a first grade certificate, and not more than one a third grade certificate.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators, of whom one shall hold a first or a second grade certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a first or a second grade certificate.
(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.	
<i>Nature of Voyage.</i>	<i>Number and Grade of Operators & Watchers.</i>
(a) Voyage exceeding 48 hours from port to port.	One operator, who shall hold a first or a second grade certificate and two watchers
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator, who shall hold a first or a second grade certificate, and one watcher.
(c) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a first or second grade certificate.
(iii) A ship of Class III shall carry one operator who shall hold a first or a second grade certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.	

Ships Fitted with Approved Automatic Apparatus.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Governor a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid:—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus:—

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators, Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. ,, 14 h. 16 h. ,, 18 h. 20 h. ,, 22 h.	from 0 h. to 6 h. 8 h. ,, 14 h. 16 h. ,, 18 h. 20 h. ,, 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° E.	from 0 h. to 2 h. 12 h. ,, 14 h. 16 h. ,, 18 h. 20 h. ,, 22 h.	from 0 h. to 2 h. 4 h. ,, 10 h. 12 h. ,, 14 h. 16 h. ,, 18 h. 20 h. ,, 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. ,, 6 h. 12 h. ,, 14 h. 20 h. ,, 22 h.	from 0 h. to 6 h. 8 h. ,, 10 h. 12 h. ,, 14 h. 16 h. ,, 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W.	from 0 h. to 2 h. 4 h. ,, 6 h. 8 h. ,, 10 h. 20 h. ,, 22 h.	from 0 h. to 2 h. 4 h. ,, 6 h. 8 h. ,, 10 h. 12 h. ,, 18 h. 20 h. ,, 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. ,, 6 h. 16 h. ,, 18 h. 20 h. ,, 22 h.	from 0 h. to 2 h. 4 h. ,, 6 h. 6 h. ,, 14 h. 16 h. ,, 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. ,, 14 h. 16 h. ,, 18 h. 20 h. ,, 22 h.	from 0 h. to 2 h. 4 h. ,, 10 h. 12 h. ,, 18 h. 20 h. ,, 22 h.

*Nature of Voyage.**Number and Grade of Operators.*

(a) Voyage exceeding 48 hours from port to port.

Two operators, one of whom shall hold a first grade certificate.

(b) Voyage not exceeding 48 hours from port to port.

One operator, who shall hold a first or a second grade certificate.

(ii) A ship of Class II shall carry one operator who shall hold a first or a second grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a first or a second grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

Qualifications of Operators and Watchers.

10. (i) Operators are graded into three grades in accordance with Rules made in the United Kingdom by the Postmaster-General with the concurrence of the Board of Trade.

(ii) Until graded in accordance with such Rules as aforesaid :—

(a) An operator who holds the British Postmaster-General's first class certificate of proficiency and who has had three years' experience as an operator, may be employed as if he held a first-grade certificate, but if an operator holding a first grade certificate is available an operator holding a first class certificate shall not be so employed on a ship

of Class I which is required to carry three operators.

(b) An operator who holds the British Postmaster-General's first or second class certificate of proficiency and who has had one year's experience as an operator may be employed as if he had a second grade certificate.

(c) An operator who holds the British Postmaster-General's first or second class certificate of proficiency and who has had less than one year's experience as an operator may be employed as if he held a third-grade certificate.

(d) In case any master or owner proposes that any person not qualified as above shall

act as operator the Inspector shall examine him, and, if he is satisfied of his proficiency, grant him a local certificate of efficiency. For such examination and certificate a fee of one guinea shall be paid by the operator at the office of the Lieutenant-Governor.

(iii) Watchers if not certificated by the British Postmaster-General shall be such as to satisfy the Inspector of their proficiency.

II. The Governor may grant certificates to operators and watchers and may accept certificates granted to operators by the Government of any part of His Majesty's Dominions, or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

MAURITIUS

(See Maps 25 and 33.)

THE Administration of the Colony and its dependencies is vested in a Governor, assisted by an Executive Council and a Council of Government.

CONTROL AND ORGANISATION.

A temporary wireless station on the s.s. *Labourdonnais* was opened in August, 1922.

A new station will be opened at Rose Belle early in 1924.

ADMINISTRATION.

The legislation affecting Wireless Telegraphy in Mauritius was originated by an Ordinance (No. 33) issued in 1903 investing the Governor with certain administrative powers. This was amended by the "Wireless Telegraphy" (Amendment, Ordinance (No. 25) of 1912. These have since been consolidated by Ordinance No. 11 of 1913, and three sets of Regulations have been framed thereunder, as follows:—

A—Ordinance No. 11 of August 22nd, 1913 (to Consolidate the Laws on Wireless Telegraphy).

B—Regulations framed under Ordinance No. 11 of 1913 (Art. 4) (August 22nd, 1913).

C—Additional Regulations respecting the transmission of messages by Wireless Telegraphy.

D—Regulations governing the transmission of messages by Wireless Telegraphy through Rose Belle Station to and from Merchant Ships at sea.

ORDINANCE No. 11.

August 22nd, 1913.

A Be it enacted by the Governor, with the advice and consent of the Council of Government, as follows:—

1. *Definition of "Wireless Telegraphy."*—In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *Licence for "Wireless Telegraphy."*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus aboard ships.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. *Regulations.*—(1) The Governor in Executive Council may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial

waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any police officer or any person appointed in that behalf by the Inspector-General of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable to a fine not exceeding five hundred rupees (Rs. 500) and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

7. *Repeal Clause.*—Ordinances No. 33 of 1903 and 25 of 1912 are repealed.

8. *Short Title.*—This Ordinance may be cited as "The Wireless Telegraphy (Amendment) Ordinance, 1913."

Passed in Council at Port Louis, Island of Mauritius, this twenty-ninth day of July, One thousand nine hundred and thirteen.

B REGULATIONS FRAMED UNDER THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913 (ARTICLE 4).

1. Apparatus for wireless telegraphy on board a merchant ship shall not be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. Apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall not be worked in such a way as to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether on shore or on any ship.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Any person who shall offend against any of these Regulations shall be liable to a fine not exceeding five hundred rupees (Rs. 500), and any apparatus for wireless telegraphy in connection with which the offence was committed may be seized and forfeited.

8. The Regulations published under Government Notification No. 19 of January 25th, 1913, are hereby repealed.

Made by His Excellency the Governor in Executive Council at a meeting held on August 22nd, 1913.

C ADDITIONAL REGULATIONS RESPECTING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEPHONY.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913.)

1. Telegrams for transmission to ships at sea will in all cases be held at the Wireless Station until the ship in question arrives within range, *i.e.*, telegrams will not be transmitted to a ship which is approaching the Island until she has called the wireless station for the first time.

2. In the case of a ship going away from the Island the telegram will be transmitted immediately on receipt at the wireless station unless she is known to have already passed out of range. In this case and in all cases where the transmission of the telegram by wireless proves to be impossible, the sender will be informed by service advice from the post office at which he handed in his telegram, and will be refunded the wireless charges.

Made by the Governor in Executive Council at a meeting held on the twenty-sixth day of December, 1919.

D REGULATIONS GOVERNING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY THROUGH ROSE BELLE STATION, TO AND FROM MERCHANT SHIPS AT SEA.

(MADE UNDER ARTICLE 4 OF THE WIRELESS TELEGRAPHY ORDINANCE No. II OF 1913.)

1. Messages received by Wireless Telegraphy from merchant ships at sea shall be handed in at Rose Belle Post Office by an officer or agent of the Wireless Station and shall be transmitted to any of the telegraph offices of the Colony for delivery to the addressee free of charge.

2. Messages for transmission to merchant vessels at sea shall be accepted at any of the telegraph offices in the Colony subject to the following charge and condition:—

(a) The charge shall be at the rate of eighty cents of a rupee per word.

(b) The minimum number of words to be charged for shall be ten.

3. The rules and regulations for the acceptance and transmission of messages by wireless telegraphy shall be in accordance with the rules and regulations at the Mauritius Post Office and Telegraphs for the time being in force.

4. Messages in code will not be transmitted or received by wireless telegraphy.

5. Regulations published under Government

Notices No. 94 of 31st May, 1919, and No. 47 of 25th February, 1920, are repealed.

Made by the Governor in Executive Council, at a meeting held on the ninth day of July, one thousand nine hundred and twenty.

Amended and Approved by the Officer Administering the Government at a meeting of the Executive Council held on the twenty-second day of August, 1922, and ordered to take effect from the 1st August, 1922.

MESOPOTAMIA (IRAQ)

(See Maps 16 and 21)

MESOPOTAMIA is recognised as an independent State with King Feisal at its head. A Treaty of Alliance between Great Britain and Iraq was provisionally signed in October, 1922, by which Great Britain will assist King Feisal's Government, in all matters political, civil and military, for a period of 20 years.

CONTROL AND ADMINISTRATION.

The 30-kW. wireless station at Basrah, erected during the late war has now been replaced by one of a valve type which was completed in January, 1923. In addition to its public service with ships at sea, it has established regular working with Abu-Zabal, Cairo, for traffic to and from Great Britain and Germany. Negotiations have also been completed for the establishment of wireless communication between Iraq and Syria via Beyrouth.

MEXICO

(See Maps 35, 38, 43 and 44.)

THE Republic of Mexico, with a President at its head, is divided into 28 states, two provinces (territorio), and a federal district.

CONTROL.

The wireless service is worked exclusively by the Federal Government, presided over by the Secretariat of Communications and Public Works. The direct control is in the hands of the Technical Department of the Dirección General de Telégrafos Nacionales.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Amado Aguirre, Engineer ..	Secretary of Communications and Public Works	Mexico.
Ricardo C. López	Director-General of National Telegraphs	Mexico.
Carlos Islas Bustamante ..	Chief of the Electro-technical Department	Mexico.

ORGANISATION.

Private installations are allowed on the conditions established by the Dirección General de Telégrafos Nacionales authorised by the Secretariat of Communications and Public Works as long as the Decree promulgated on October 19th, 1916, is not violated. The radiotelegraphic stations open for public service to ships are fifteen in number.

There are at present no radiotelegraphic arrangements in connection with aviation. Time and weather signals combined with "Shipping Advice" services are sent out from the coastal wireless stations daily.

ADMINISTRATION.

National Radiotelegraphic Laws are being drawn up. The only extant decree relative to radiotelegraphy runs as follows:—

A—Decree of October 19th, 1916.

B—Use of Wireless Apparatus at the Port of Tampico.

A ART. I.—The establishment and exploitation of Radiotelegraphic Stations is forbidden in the Mexican Republic except under the express authorisation of the Federal Government, which can only accord it on the terms and under the conditions which are contained in the Regulations attached to the said Law.

ART. II.—Anyone who without the authorisation of the Federal Government establishes a Radiotelegraphic Station shall be liable to a penalty of 500-1,000 pesos, or imprisonment from 1 to 11 months, or shall suffer a combination of both penalties in accordance with the seriousness of the offence. Moreover, all apparatus, machines, and accessories forming part of the installation shall be sequestered for the benefit of the State.

ART. III.—If any corporation which installs a Radiotelegraphic Station be a company or any other responsible body, direct responsibility with regard to the infraction of this law is vested in the person of the directors, agents or administrators.

ART. IV.—Any persons who make use of a Radiotelegraphic Station installed without the authorisation of the Federal Government shall be liable to a punishment of half the penalty enacted in ART. II preceding.

ART. V.—Any persons who make use of a Radiotelegraphic Station without the authorisation of the Federal Government, or who intercept a communication between Public Departments, or who divulge its contents,

shall be liable to the penalty which is contained in ART. 770 of the Penal Code of the Federal District.

ART. VI.—This Law enters into operation from the date of its publication.

B In accordance with Article 8 of the London Convention, which requires that "The working of radio stations shall be organised as far as possible so as not to disturb the working of other radio stations," and Article XLVI, Service Regulations affixed to the International Radiotelegraphic Convention of 1912, which requires that "The exchange of correspondence between shipboard stations shall be carried on in such a manner as not to interfere with the service of the coastal stations, the latter, as a general rule, being accorded the right of priority for the public service."

It is notified that American vessels when anchored in the port of Tampico, must not engage in the transmission of wireless messages to other American ships and to coastal stations in the United States at all times. Certain hours have been set apart for this purpose so as not to inconvenience Mexican stations at or near Tampico, and it has been requested that such vessels, while in the port of Tampico, confine their wireless operations to the hours specified for that purpose by the Mexican authorities.

Operators on ships arriving at Tampico should ascertain from the Mexican Radio Station at that port (XAJ) during what hours they may use their transmitter while at anchor in the harbour.

MONACO

MONACO is a department of France, but a Principality with Prince Louis the reigning monarch.

ADMINISTRATION.

There is no commercial wireless telegraphy and telephony in the State. Private installations are regulated by the decree printed below.

A—Decree ruling the conditions of the establishment and use of radiotelegraphic apparatus designed solely to receive time and meteorological telegrams.

ORDER.

A We, Ministers of State of the Principality,

Considering the agreement between the Government of the Principality and the French Government, resulting in an exchange of letters on April 12th, 1921.

Considering the deliberations of the Government Council on March 19th, 1921, and March 8th, 1922.

DECREE

The conditions ruling the establishment, use and employment are fixed as follows by such persons in the Principality of the radiotelegraphic stations designed solely to receive time signals and meteorological telegrams.

ART. 1.—Applications for licences must be addressed to the Minister of State. The application must indicate the precise spot where the station will work and furnish a description of the apparatus employed.

ART. 2.—The licence is granted by the Minister of State.

ART. 3.—The receiving stations endorsed in Article 1 can only be used for the receipt of time signals and meteorological telegrams. All transmission of signals is formally prohibited.

ART. 4.—The contents of radiotelegrams, other than meteorological ones, which would eventually be collected by the authorised receiving stations, must not be written down nor made known to anyone outside the officials appointed by the Administration, or of competent legal police officers.

No use whatever shall be made of these telegrams.

ART. 5.—The Administration reserves the right to subject the receiving stations to such control as seems proper.

ART. 6.—The State will be under no responsibility on account of the use of the receiving stations of wireless telegraphy, concession for which has been granted.

ART. 7.—The concessionaires must notify the Minister of State of any modification which they propose to adopt in the installation of their station.

The Administration can, moreover, at any time, and for whatever reason, suspend or revoke the granted permissions, without having to pay any indemnity whatever or making known any motive for their decision.

These licences carry no privileges, and cannot be made an obstacle to any similar licences granted subsequently to any other petitioner whatever. They cannot be transferred to a third party without the express consent in writing of the Administration.

At the first application of the Administration, each licensee must immediately place his station out of working order.

ART. 8.—The licensee must submit to all customary or fiscal arrangements resulting from the laws, rules and regulations which may happen to occur in the affairs of establishment or use of the wireless telegraphy stations.

ART. 9.—The licensee must pay a statistical fee fixed at 10 francs per annum, and for each authorised receiving station.

ART. 10.—The cost of stamps applied to the acts relating to the licence of time signal stations are to be borne by the licensee.

ART. 11.—The present order shall be deposited at the General Secretary's Office of the Minister of State, to notify whom it may concern.

ART. 12.—The Counsel to the Government for Public Works and Miscellaneous Affairs is charged with the execution of the present Order.

Executed at Monaco, at Government House, March 24th, 1922.

R. LE BOURDON,
Minister of State.

MOROCCO

(See Maps 2, 24 and 28)

BY the Conference of Algeciras, held in 1906, France and Spain agreed to organise the police force and customs of the coast towns, whilst the internal government of the country lies mainly in the hands of the Sultan and his advisers.

(a) FRENCH ZONE.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
M. le Colonel Appiano ..	Directeur du Service des Transmissions ..	Résidence Général Rabat.
M. Walter	Directeur de l'Office des Postes Télégraphes et Téléphones	Résidence Général Rabat.

The Directeur du Service des Transmissions at the Residency General is in control, through a controlling station at the Residency General, of all wireless telegraph stations, Civil, Military, and Naval, in the French zone.

ORGANISATION.

The present organisation consists of the Shereefian Government stations at Tangier and Casablanca. These are for public use, the stations at Fez, Mequinez, Marrakech, Agadir, and others, being solely for military use. The station at Mediuna is to be used only for the transmission of public and official urgent (triple paid) messages.

A station has been installed at Casablanca for aviation purposes.

Meteorological reports are transmitted four times daily from Mediuna (C.N.M.)

There are direction finding stations at Kenitra and Chetaba.

ADMINISTRATION.

Wireless telegraph forms a Government monopoly.

Military wireless telegraph stations keep headquarters at Rabat informed as regards meteorological conditions for the use of the military Aeronautical Bureau.

The current laws and regulations governing wireless telegraphy consist of the Radiotelegraphic Convention of London, 1912.

No licences are given, and legislation for the grant of licences for working wireless telegraphy will not be undertaken.

Generally the French laws and regulations apply also to Morocco.

A law regulating wireless telegraphy for air service will shortly be issued.

(b) SPANISH ZONE.

CONTROL AND ORGANISATION.

At the present time there are in existence the following stations : Melilla (EGB), erected in July, 1908 ; Ceuta and Tetuan (EGD and EGK respectively), in July, 1911, and July, 1914, and Larache (EGF), in December, 1911.

The officers in command of these stations are as follows :—

Official.	Title.	Address.
Don Andres F. Mulero ..	Major of Engineers	Melilla.
Don Juan Reig y Valerino ..	Major of Engineers	Ceuta and Tetuan.
Don Francisce L. Trejo ..	Captain of Engineers	Larache.

These are the only permanent wireless stations in the Spanish Zone. They are all under the jurisdiction of the Ministry of War, and are controlled by the Centro Electro-tecnico y de Comunicaciones (Engineers).

ADMINISTRATION.

Existing arrangements as regards meteorological information are the same as those for Spanish stations, the Madrid station being in charge of this service.

The regulations governing these stations are the same as for Spain, and licences are given by the Centro Electro-tecnico y de Comunicaciones after the necessary examinations.

MOZAMBIQUE

(PORTUGUESE EAST AFRICA).

(See Maps 25, 31 and 32.)

PORTUGUESE East Africa comprises three distinct territories :—

(a) The Province of Mozambique, directly administered by the Portuguese Government.

(b) The Companhia de Moçambique, a chartered company with Sovereign rights subject to the control of the Government in matters relating to the Portuguese Sovereignty, international and judicial rights, agreements and conventions.

(c) The Companhia do Niassa, also a company with a similar Royal Charter.

CONTROL AND ORGANISATION.

The Wireless service is a State monopoly under the control of the Repartição Superior dos Correios e Telegrafos of the Province of Mozambique. The existing stations are of low power, that at Lourenço Marques being only 2-kW., but the projected scheme includes a 25-kW. station in that district, for inter-colonial service, two 15-kW. stations which are being built at Tete and Mozambique, four 1½-kW. stations at Lourenço Marques, Inhambane, Quelimane and Mopeia, and smaller stations at Vila Nova de Gaza, Chinde and Angoche.

ADMINISTRATION.

Wireless Telegraphy is administrated under the Decrees of 21st January, 1910, and 26th November, 1916, issued by the Portuguese Government for the control of all their Colonies. The Laws and Regulations governing the administration are similar to those in force in Portugal.

NEW CALEDONIA

(See Map 56.)

Including : New Hebrides, Loyalty Islands, The Isle of Pines, The Wallis Archipelago, The Huon Islands, Futuna and Alofi.

NEW CALEDONIA is under the administration of a Governor assisted by a Privy Council. The seat of administration is Nôuméa, the capital, where there is a station under French control.

NEW HEBRIDES

The New Hebrides consist of four groups of islands, the Banks, Torres, Central, and Southern, administered by a Condominium established under a Convention between Great Britain and France, signed on October 20th, 1906, each country being represented by a Resident Commissioner. The seat of Government is at Vila, in the island of Efate. The laws of the two nations apply to their respective nationals in the group, as also such joint regulations as may be passed by the Resident Commissioners, or the High Commissioners for Great Britain and France under the authority of the Convention referred to. Natives are subject to regulations similarly enacted.

CONTROL AND ORGANISATION.

An agreement was arrived at in 1913 between the British and French Governments to establish a wireless telegraph station in the New Hebrides at the joint expense of the two Governments. The station at Vila was opened to the public in September, 1916.

Wireless telegraphy in the New Hebrides is practically a State monopoly. No provision is made for licences for private installations, which are prohibited, except with the permission of the administration. The Resident Commissioners are responsible for the control of radiotelegraphic activity in the islands. The only station at present is the land station of Vila, which is directly controlled by Government and is open for public service to ships.

There are no firms or companies engaged in the manufacture of wireless apparatus and no wireless societies or clubs. No aviation radio stations exist. A meteorological message is sent out daily to Fiji.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
The British and French Resident Commissioners		Vila

ADMINISTRATION.

Two joint regulations affecting wireless telegraphy have been issued by the Condominium Administration, the first dated January 7th, 1909, No. 1, "The Wireless Telegraph Regulation, 1909," the other the "Wireless Telegraph (Ships) Regulation, No. 3, of 1916."

The texts of these appear below :—

- A—Regulation dated 1909.
- B—Wireless Telegraph (Ships) Regulation, 1916.

A JOINT REGULATION TO REGULATE THE INSTALLATION OF WIRELESS TELEGRAPHY IN THE NEW HEBRIDES.

1. From the date of the passing of this regulation it shall be unlawful for any person to use or establish in any of the islands of the New Hebrides, including the Banks and Torres Islands, any apparatus or installation for the purpose of electrical communication by wireless telegraphy without a licence first obtained from the Resident Commissioners conjointly such

licence to be granted on such terms and conditions as the Resident Commissioners aforesaid may from time to time determine.

2. Any person offending against the provisions of the preceding section or failing to comply with the terms and conditions of a licence when granted by the Resident Commissioners under the provisions of this regulation shall be liable to a penalty not exceeding twenty pounds and to forfeit any apparatus used or established for the purpose aforementioned.

3. Offences against this regulation shall be justiciable by the Joint Court contemplated by the tenth Article of the Anglo-French Convention of the twentieth day of October, one thousand nine hundred and six, and pending the establishment of such court by the court of the nation to which or to whose legal system the accused may belong.

4. This regulation may be cited as "The Wireless Telegraphy Regulation, 1909."

Published and exhibited at the Public Offices of the Resident Commissioners for His Britannic Majesty and for the French Republic this seventh day of January in the year one thousand nine hundred and nine.

A JOINT REGULATION TO CONTROL THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT VESSELS IN THE NEW HEBRIDES.

B 1. From the date of the passing of this regulation all apparatus for wireless telegraphy on board merchant ships in the territorial waters of the New Hebrides shall be worked in such a way as not to interfere with:

- (a) Naval signalling;
- (b) The working of any wireless telegraph station lawfully established, installed or worked in the New Hebrides or the territorial waters thereof; and

(c) The transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraph on board a merchant ship shall be worked or used while the ship is in any of the harbours of the New Hebrides except with the joint special or general permission of the Resident Commissioners.

3. The Resident Commissioners shall have power to issue such further rules as to them may seem expedient for the control of wireless telegraphy on merchant vessels and for the censorship or messages transmitted from such vessels while in the territorial waters of the Group.

4. Any infraction of this regulation shall be punishable by the Joint Court with a money penalty of from one to twenty pounds and imprisonment for one day to one month or with one or other of these penalties.

5. This regulation may be cited as the "Wireless Telegraph (Ships) Regulation, 1916."

Published and exhibited in the Public Offices of the Resident Commissioners for Great Britain and the French Republic, at Vila, in the New Hebrides, this 30th day of October, 1916.

NEWFOUNDLAND AND LABRADOR

(See Map 37)

THE Executive is vested in a Governor aided by an Executive Council.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sir R. A. Squires, K.C. LL.B., K.C.M.G.	Prime Minister and Colonial Secretary..	St. John's
Hon. W. W. Halfyard	Minister of Marine and Fisheries ..	do.
Hon. Thos. Bonia	Minister of Posts and Telegraphs.. ..	do.
Hon. Arthur Mews, C.M.G.	Deputy Colonial Secretary	do.
Mr. H. W. Le Messurier, J.P., C.M.G. ..	Deputy Minister of Customs	do.

CONTROL.

The Deputy Minister of Customs refuses clearance to any vessels of Newfoundland Register not licensed in conformity with the Acts, or whose operators are not in possession of provisional service certificates issued by the Minister of Posts.

ORGANISATION.

The Sealing Industry forms an important item in the industrial activities of the Colony, and the disaster of 1914 (wherein the *Southern Cross* was lost with all hands) led to the instalment of wireless equipment on the fleet of sealers, which was made compulsory by legislation to that effect.

The small cable connection between the Islands of Ramea and Gaultois on the South Coast, which frequently became interrupted, have been abandoned and wireless stations erected, and Flat Island and St. Brendan's in Bonavista Bay have also similar wireless stations and are now in direct connection with the Government Postal Telegraph lines on the mainland. Moving ice in the early Spring frequently damaged the cable sections, and in such cases prompt repairs were difficult and costly, and could only be effected in calm summer weather.

At the present time the following stations exist :—

Public service to ships	5
Government service only	1
Public inland traffic	9
Direction-finding service	1
Ship stations	17

ADMINISTRATION.

The general regulation of wireless is governed by the Posts and Telegraph Acts, 1891 to 1906.

A—Act of 1905 (Cap. VII).

B—Post and Telegraph Act, 1906.

C—Wireless Telegraphy (Steamers) Act, 1914.

D—Wireless Licence.

E—Provisional Certificate for Wireless Operators.

F—Amateur Experimental Licence.

THE ACT OF 1905, CAP. VII.

A This Act refers to taxes upon business transacted by telegraph and telephone companies within and in transit through the Colony. Clause 2, Section 2, reads as follows :—

A sum equal to one per cent. in manner hereinafter provided of the total amount received by or due to the company in respect of all telegraphic messages passing over the land lines of the company or transmitted or received by any wireless method of telegraphy to or from any place within this Colony from or to any other place within this Colony during a period of twelve calendar months ending on the first day of May of each year: Provided that this subsection shall not apply to messages which originate or are delivered in any place outside the Colony.

The first of such payments shall be made on the 30th day of June, 1906, in respect of the period of twelve months ending on the preceding first day of May.

Section 4 of the same Clause (2) reads as follows :—

A sum of four thousand dollars (\$4,000) in respect of every wireless telegraph station or other means of communication by wireless methods of telegraphy between this Colony and any place, ship or vessel outside this Colony, for the time being belonging to or worked by or on behalf of the company which now is or hereafter shall be established in this Colony.

The first of such payments shall be made on the 30th day of June, 1906: Provided that if the Governor in Council is satisfied that any such wireless telegraph station or other such means of communication is established for the purpose only of reporting passing ships or vessels, he may dispense the payment of such last-named sum and discharge the company from liability therefor in respect of such station or means of communication.

Clause 1 (1) of the Act of June 15th, 1905, Cap. XXI, reads :—

Whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony shall have control over the transmission of messages over any telegraph line, telephone line, or by any other form of telegraphy, it shall be lawful for the Governor in Council at any time to assume and for any length of time retain possession of any telegraph line, telephone, or any form of telegraphy in this Colony,

and of all things necessary for the efficient working thereof, and may for the same time require the exclusive service of the operators and other persons employed in working such telegraph line, telephone, or any form of telegraphy; and the company or other proprietor of such telegraph line, telephone or any form of telegraphy, shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders and transmit and receive such despatches as they are required to receive and transmit by any officer duly authorised by the Governor in Council, and every company or other proprietor, operator or person violating any of the provisions of this section shall incur a penalty not exceeding one hundred dollars (\$100) for every refusal or neglect to comply with the requirements thereof, such penalty to be recovered by action in the name of the Minister of Finance and Customs, in a summary manner before a Stipendiary Magistrate or Justice of the Peace.

POST AND TELEGRAPH ACT, 1906.

B 1. (1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy, in any place in this Colony or on board any ship registered in this Colony, except under and in accordance with a licence granted in that behalf by the Postmaster-General, with the consent of the Governor in Council.

(2) Every such licence shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted, and any such licence may include two or more stations, places or ships.

(3) If any person establishes a wireless telegraph station without a licence in that behalf, or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of a misdemeanour, and be liable on conviction in a summary manner before a Stipendiary Magistrate to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no

proceedings shall be taken against any person under this Act except by order of the Postmaster-General.

(4) If a Stipendiary Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship as aforesaid without a licence in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) When a fine under this Act is imposed by a Court, Judge or Magistrate, and the master or owner of any ship is ordered to pay the same and the same is not paid at the time and in the manner prescribed, the Court, Judge or Magistrate making the order may, in addition to any other powers they may have for the purpose of compelling payment, direct the amount remaining unpaid to be levied by distress and sale of the ship, her tackle, furniture and apparel.

(6) The Postmaster-General may make regulations for prescribing the form in which applications for licences under this Act are to be made, and, with the consent of the Governor in Council, the fees payable on the grant of any such licence.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Post and Telegraph Acts, 1891 to 1904," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

2. This Act shall be read with and form part of "The Post and Telegraph Acts, 1891 to 1904," and the said Acts and this Act may be cited as "The Post and Telegraph Acts, 1891 to 1906."

WIRELESS TELEGRAPHY (STEAMERS) ACT.

C The following Act respecting the provision of wireless telegraphy on steamers engaged in the trade of Newfoundland was passed on September 4th, 1914:—

1. Every steamer to which this Act applies shall be provided:—

(1) With a wireless telegraph installation approved of by the Minister of Marine and Fisheries;

(2) With at least one qualified wireless operator approved of by the Postmaster-General;

(3) With a Morse signalling apparatus approved by the Minister of Marine and Fisheries;

(4) With at least one person on board capable of operating such signalling apparatus and of reading signals from other ships.

2. The wireless telegraphy installation provided on a ship to which this Act applies shall be maintained in good order and shall be attended to by an operator qualified as aforesaid in accordance with rules and regulations to be made by the Governor in Council under this Act for the purposes thereof.

3. No steamer to which this Act applies shall receive a clearance at any Custom House for the Seal Fishery or otherwise unless and until the Collector is satisfied that the provisions of this Act in respect of said steamer have been complied with.

4. If any requirement of this Act is not complied with in the case of any steamer to which this Act applies, the master or owner shall be liable for each offence to a fine of twenty-five hundred dollars, to be recovered in a summary manner before a Stipendiary Magistrate.

5. This Act shall apply to any steamer which ordinarily is engaged in prosecuting the Seal fishery from any port of this Colony, when engaged in the Seal fishery or when carrying more than sixty persons; and to any other vessel carrying passengers from or within this Colony when named by the Governor in Council in a Proclamation to be published in the *Royal Gazette*.

6. Nothing in this Act shall affect the obligation to obtain a licence for a wireless telegraphy installation under "The Postal and Telegraph Acts, 1891 to 1906," or prevent the Governor in Council or other persons exercising a like control over such wireless telegraphy in times of war or otherwise as may be exercised in respect of other wireless telegraphy.

D SHIP LICENCE No.....
W. 19 19...

COLONY OF NEWFOUNDLAND.

"LICENCE TO USE WIRELESS TELEGRAPHY."

Issued in accordance with the provisions of the London Convention of 1912.

The herein named..... resident of..... is hereby licensed to establish and operate a wireless telegraph station on board the shipfor the term or period commencing on the first day of April, nineteen hundred and..... and terminating on the thirty-first day of March, nineteen hundred and.....and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar, being the licence fee for the privilege above named.

This licence is subject to the following terms, conditions and restrictions:—

1. In this licence, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:

The expression "marine signalling" means signalling by means of any system of wireless telegraphy between two or more ships, between ships and shore stations and any other wireless telegraph station, or between shore stations and ships.

2. (1) The licensee shall not establish, install or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

(2) No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Government of Newfoundland.

3. (1) The licensee shall so operate the licensed apparatus as not to interfere with the working of any wireless telegraph station established in Newfoundland, or with marine signalling on the waters or territory of Newfoundland or neighbouring waters or territory.

(2) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(b) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(c) Generally with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not, without the consent of the Postmaster-General, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

4. The licensee shall, if so required in writing by the Postmaster-General, cease to operate the licensed apparatus for such period (not exceeding.....hours in any one day) as may be specified by the Postmaster-General.

5. Subject to the provisions of this licence, and in accordance with the regulations issued from time to time by the Postmaster-General, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship without regard to the particular system of wireless telegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

6. The licensee shall not be obliged to transmit and receive commercial messages by means of the licensed apparatus to and from a ship station on a ship registered in a country which does not adhere to the International Radiotelegraphic Convention, unless instructed so to do by the Postmaster-General in his regulations.

7. (1) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Newfoundland or Canadian Government vessels), such messages shall have priority over all other messages, and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages, and the rates to be charged on such messages shall not exceed half the rates charged the ordinary public.

(2) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

8. The licensee shall, so far as possible, receive from all other stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by marine signalling or by any system of wireless telegraphy.

10. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such

messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licence shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraphic Convention, and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the head office of the licensee, in between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

11. The Postmaster-General or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

12. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose by the Postmaster-General and shall forward the same to the Postmaster-General at the end of each month.

13. (1) The licensee shall observe at the station the provisions of the International Radiotelegraphic Convention as adhered to by His Majesty in respect of the Colony of Newfoundland and the detailed regulations from time to time made thereunder for carrying such provisions into effect.

(2) The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Postmaster-General.

14. Except with the consent in writing of the Postmaster-General the licensee shall not assign or sublet this licence.

15. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Postmaster-General.

Certificates shall be granted to persons of such technical proficiency, and shall be in such form and subject to such conditions as the Postmaster-General may from time to time prescribe.

16. The licensees shall carry this licence on the ship on which the ship station is established under this licence, and also such documents as may be prescribed by the Postmaster-General, for the purpose of enabling the licensee to communicate with coast stations in accordance with the rules and regulations of the International Radiotelegraphic Convention of Berlin, 1906.

17. (1) If, and whenever, in the opinion of the Postmaster-General or any officer in command of one of His Majesty's ships of war, an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for the said Postmaster-General, by warrant under his hand, to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's

service and, subject thereto, for such ordinary services as to the said Postmaster-General may seem fit, and in that event, any person authorised by the said Postmaster-General may enter upon the stations of the licensee, and take possession thereof and use the same as aforesaid.

(2) The Postmaster-General or any officer in command of one of His Majesty's ships of war may, when he considers such an emergency as aforesaid to have arisen, instead of taking possession of the stations of the licensee, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly and in such manner as he may direct, and such persons may enter upon the licensee's premises accordingly, or the said Postmaster-General or officer may direct the licensee to submit to him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said Postmaster-General or officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) In any such case as aforesaid, if the licensee shows that during the exercise of any of the powers aforesaid, his receipts for the licensed apparatus with respect to which the said powers have been exercised have been less than his receipts from the same source during a corresponding period, the Government shall pay to the licensee, as compensation for any loss of profit sustained by the licensee by reason of the exercise by the Postmaster-General of any of the powers hereby reserved, such sum as may be settled between the Postmaster-General and the licensee by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Postmaster-General are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and, save with the consent of the Postmaster-General, no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing direct or suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Postmaster-General may by writing revoke and determine these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General, from time to time, to establish, extend, maintain and work any system or systems of wireless telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Postmaster-General, from time to time, to enter into agreements for or to grant licenses relative to the working and user of wireless telegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of wireless telegraphy, with or to any person or persons whosoever upon such terms as he shall, in his discretion, think fit.

20. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Postmaster-General under these presents may be under the hand of any authorised officer, for the time being, of the Newfoundland Postal Telegraph Department and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Postmaster-General, St. John's, Newfoundland.

Minister of Posts and Telegraphs.

DEPARTMENT OF THE POSTAL TELEGRAPHS,
NEWFOUNDLAND.

Dated at St. John's this.....day of
.....19..

PROVISIONAL WIRELESS OPERATOR'S CERTIFICATE.

This is to certify that the
E bearer
 resident of
 is a British subject and is certified by the
 local Superintendent of the Marconi Wireless
 Telegraph Company of Canada to have the
 necessary technical proficiency for the position
 of wireless operator having acted as such on
 the steamer plying
 upon the territorial waters of Newfoundland
 from
 to

He has subscribed to the Oath of Secrecy and understands that this certificate is a provisional one, valid for not more than six months from the date of issue inscribed hereon.

Issued in accordance with the London Convention, 1912, and the Wireless Telegraphy (Steamers) Act, 1914, Newfoundland Legislature, and regulations made thereunder.

General Post Office,

St. John's, Newfoundland.

.....day of

*Minister of Posts and Telegraphs,
Newfoundland.*

Name of Station.	Normal Range.	Description of Receiving Apparatus.	Wave-length.	Source of Power and Maximum Output.	Maximum Power taken by Transmitting Instruments.		Frequency of Alternator, if any.	Ship Charge.
					Volts.	Amps.		

AMATEUR EXPERIMENTAL LICENCE.
192.... LICENCE No.....

DOMINION OF NEWFOUNDLAND.

LICENCE TO USE RADIOTELEGRAPHY.

F Issued in accordance with the provisions of the London Convention, 1912, and the Post and Telegraphs Amendment Act, 1906, and these Regulations made thereunder.

The herein named..... resident of herein called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at..... for the term of one year commencing on the..... day of..... and terminating on the..... day of..... and to install and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of One Dollar (\$1) being the licence fee for the privilege above named.

This licence is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this licence, the term "Minister" means the Minister of Posts and Telegraphs service for the time being.

2. (1) The licensee shall not establish, install or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(2) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Newfoundland or the territorial waters abutting on the coasts of Newfoundland (whether on shore or on any ship), by or for the purposes of the Minister of any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(a) With respect to all arrangements to be adopted for the purpose of securing systematised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(b) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (1) The coupling between the primary and the secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(2) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy.

11. The licensed apparatus shall be operated in accordance with the Regulations issued by the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

13. (1) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the licence or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(2) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licences, powers and authorities hereinbefore granted, and thereupon these presents, and the said licences, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to those hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licences relative to the working

and use of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Postal Telegraph Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Minister of Posts and Telegraphs, St. John's Newfoundland.

..... Minister of Posts and Telegraphs.

St. John's Newfoundland.

.....day of.....192

Department of the Postal Telegraphs, St. John's, Newfoundland.

Dated this.....day of.....192

SCHEDULE.

1. Name of station.....
2. Location.....
3. Call Signal.....
4. Classification of station under Regulation No.
5. Type of aerial.....
6. Natural wavelength of aerial.....
7. Transmitting wavelength.....
8. Decrement per complete oscillation.....
9. Characteristics of transmitting.....
10. Characteristics of receiver.....
11. Source of power.....
12. Maximum to be taken by transmitter.....
13. If A.C. number of cycles.....
14. Hours during which the station must not transmit.....
15. Stations with which the licensed stations may communicate.....

..... Minister of Posts and Telegraphs.

Department of the Postal Telegraph Service, St. John's Newfoundland.

Dated this.....day of.....192.....

SPECIAL REGULATIONS FOR AMATEUR EXPERIMENTAL STATIONS.

1. At amateur experimental stations the power used measured at the terminals of the transformer must not exceed $\frac{1}{2}$ kw.

2. The wavelengths which may be used vary with the distance between the licensed station and any commercial coast or land station or a route of navigation as follows—

For transmission:—

Class I—Station located within five miles of a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 50 metres.

Class II—Stations located more than five but less than 25 miles from a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 100 metres.

Class III—Stations located more than 25 but less than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 150 metres.

Class IV—Stations located more than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 200 metres.

3. A distinctive call signal shall be allotted to each station commencing with the figure "8," e.g., 8AA, 8AB, which signal must be sent not less than three times at the termination of every transmission.

4. The Regulations of the International Radiotelegraph Convention, where applicable, be observed by the station.

5. The station must take every precaution to prevent interference with the working of other stations.

6. The station, when operating, must listen for the signal "STP" which will indicate that an amateur experimental station is interfering with commercial business.

7. The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

8. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times such as when the spark is being tested or sending is being practised the aerial must be disconnected.

NEW ZEALAND

(See Maps 55 and 56.)

Including : Auckland Island, Chatham Islands, The Cook and other Pacific Islands, Kermadec Islands and Western Samoa.

THE Dominion of New Zealand consists of three main islands in the South Pacific Ocean, known as the North, South, and Stewart Islands. The New Zealand Government also administers the former German possession of Western Samoa, and, conjointly with the Imperial Government and the Government of Australia, the Island of Nauru.

The constitution rests upon the Act of 1852, under which the Executive authority is vested in a Governor-General assisted by a Council of Ministers with a legislature of two houses.

CONTROL.

The Post and Telegraph Department is responsible for the administration of wireless telegraphy in New Zealand. The permanent head of this Department is the Secretary of the General Post Office at Wellington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Hon. Mr. J. G. Coates	Postmaster-General and Minister of Telegraphs.	Wellington
Mr. A. T. Markman	Secretary, General Post Office	Wellington
Mr. E. A. Shrimpton, M.I.E.E. ..	Chief Telegraph Engineer	Wellington
Mr. G. McNamara	First Assistant Secretary	Wellington
Mr. J. Robertson	Second Assistant Secretary	Wellington
Mr. A. Gibbs, M.I.E.E.	Deputy Chief Telegraph Engineer ..	Wellington
Mr. F. T. R. Johnson	Controller of Savings Bank and Accounts	Wellington

ORGANISATION.

A short account of the earlier history of the development of wireless telegraphy in New Zealand may be found in the "Year Book," for 1923. At the present time four stations in New Zealand are open for public service with ships, and at a fifth station a listening service for distress or other urgent calls from ships is maintained.

PRIVATE STATIONS, AMATEUR AND EXPERIMENTAL.

To meet the growing demand for permission to experiment in wireless telegraphy, the Department issued provisional permits authorising the use of receiving apparatus for experimental or instructional purposes, the conditions of the permits being designed to prevent interference with the conduct of public wireless telegraph work. Regulations governing the issue of licences for amateur, experimental and broadcasting stations were gazetted on January 18th, 1923, the provisional permits being then recalled and replaced, when required, by formal licences. The new Regulations and the terms of the licences are printed below. The interest taken is evidenced by the fact that 1,700 licences were issued in a period of approximately six months. Amateur transmitting stations are divided into three classes: (1) Experimental Stations for the work of pure research in radio science by Universities and other scientific institutions and bodies; (2) Amateur Stations, Grade I, for highly qualified amateurs, and (3) Grade II for those not so highly qualified, but holding a Grade II operator's certificate. In six months three experimental stations, fifteen Grade I and eighteen Grade II have been licensed. Private stations are not allowed to employ spark transmitters.

BROADCASTING STATIONS.

There are now six broadcasting stations operating in New Zealand, Mutual interference is limited as far as practicable. The North and South Islands have mapped out suitable areas in which broadcasting stations of an appropriate power and using certain fixed wavelengths are to operate.

WESTERN SAMOA.

The regulations governing the issue of licences for amateur, experimental and broadcasting stations are applicable in the mandated territory of Western Samoa, with the exception of Clauses 10a-22 (regarding British nationality). The powers conferred on the Minister of Telegraphs or the District Radio Inspector are, in the case of Western Samoa, to be read as references to the Administrator, the Secretary to the Administrator, or the Superintendent, Apia Radio Station, as the case may be.

EXTENDED WORKING BETWEEN SHORE AND SHIP STATIONS.

An agreement has been arrived at with the Administrations of the Commonwealth of Australia and Fiji, which permits intercommunication during certain hours between ship and shore stations *other than the nearest coast station* in waters bounded by the three countries:

The restrictions on extended-range working are :—

- (1) That Article XXIV (5) of the International Radio Telephonic Regulations must be strictly observed.
- (2) That extended-range working may be undertaken only when a ship is not less than 300 miles distant from a coast station.
- (3) Extended-range working is permitted only between the hours of 1300 and 0500 (G.M.T.) in the case of New Zealand and Australian coast stations, and from 1100 to 0500 (G.M.T.) for communication with Fiji coast stations.

RADIO DIRECTION FINDING AND RADIO BEACONS.

The Marine Department has recently been investigating the advisability of making use, in the Dominion, of radio direction finding and radio beacons for navigational purposes. Satisfactory tests have been made on the Three King's Islands with a radio beacon apparatus. Further similar tests are, however, to be made at Cape Maria Van Diemen before the question of installing a radio beacon is decided.

ADMINISTRATION.

In July, 1914, regulations were made for the control of ships carrying wireless telegraph apparatus while within the territorial waters of New Zealand. These regulations were revoked and others made in lieu thereof by order in Council dated January 30th, 1918, a further amendment being made by Order in Council dated January 17th, 1923. The regulations relating to ship stations were also amended by new regulations issued on September 14th, 1914, and further amended on January 17th, 1923.

The Laws and Regulations at present in force are printed below :—

- A**—Extract from the Post and Telegraph Act, 1908 (Part X).
- B**—Extract from the Post and Telegraph Amendment Act, 1911 (amended 1920).
- C**—Extract from the Post and Telegraph Amendment Act, 1922.
- D**—Regulation affecting all ships within the territorial waters (amended January 17th, 1923).
- E**—Regulations affecting ships registered in New Zealand.
- F**—Form of Ship Licence.
- G**—Provisional Permit for Experimental or Instructional Apparatus.
- H**—Radio Telegraph Regulations for Amateur, Experimental and Broadcasting Stations.
- I**—Amateur Receiving Licence.
- J**—Experimental Transmitting Licence.
- K**—Amateur Transmitting Licence (Grades I and II).
- L**—Broadcasting Licence.
- M**—Samoa Post and Telegraph Amendment Order, 1923.

POSTS AND TELEGRAPHS ACT

A The following extracts from Part X of the Post and Telegraph Act, 1908, and from the Post and Telegraph Amendment Acts, 1911, 1913, and 1920, relate to wireless telegraphy in the Dominion :—

162. The Governor may from time to time establish stations for the purpose of receiving and transmitting telegraph messages within New Zealand or between New Zealand and parts beyond New Zealand by what is commonly known as "wireless telegraphy," including in that expression every method of transmitting messages by electricity other-

wise than by wires, whether such method is in use at the time of the coming into operation of this Act, or is hereafter discovered or applied.

163. The provisions of Part VII of this division of this Act shall, as far as is applicable, *mutatis mutandis*, extend and apply to stations established under this part of this Act, and to communications by wireless telegraphy.

164. Every person who erects, constructs, or establishes any station or plant capable of transmitting or receiving wireless telegraphic signals otherwise than in accordance with a licence granted by him in that behalf by the

Minister of Telegraphs is liable to a fine not exceeding five hundred pounds, and any plant, machinery, instruments, and material used by him for such purpose may be forfeited and dealt with as the Minister directs.

Part VII of this division of the Act referred to deals with the construction and regulation of electric lines. It authorises the Governor to establish electric lines and purchase lines and plant. He may make regulations as to the management, working and maintenance of any telegraph. Any officer or person employed in the working of any telegraph who improperly divulges the contents of any telegram transmitted or presented for transmission by such telegraph, or the purport of such telegram, is liable to a fine not exceeding one hundred pounds, or to imprisonment with hard labour for any period not exceeding six months.

EXTRACTS FROM AMENDMENT ACTS, OF 1911, 1913 AND 1920.

POST AND TELEGRAPH (AMENDMENT) ACTS 1911 AND 1920.

B The Minister of Telegraphs may in accordance with regulations to be made in that behalf by the Governor-General in Council, grant licences to any person, association, or corporation for the installation and working within New Zealand or on board any ship registered in New Zealand, of apparatus for wireless telegraphy, within the meaning of Part X of the principal Act.

(2) Subject to any such regulation, every such licence shall be in such form and for such period and shall contain such terms, conditions, and restrictions, as the Minister of Telegraphs thinks fit.

(3) The Governor may by Order in Council make such regulation as he thinks proper as to the granting of such licences, and as to the form, period, terms, conditions, and restrictions thereof and as to the fees payable in respect thereof.

POST AND TELEGRAPH (AMENDMENT) ACT 1913.

9. (1) The Governor may from time to time, by Order in Council, make such regulations as he thinks proper governing the use of wireless telegraph apparatus on merchant ships whether foreign ships or British ships not registered in New Zealand, while within the territorial waters of New Zealand.

(2) Such regulations may provide for the detention of any merchant ship on which a breach of the regulations has been made, pending the institution and determination of proceedings in respect of such breach and the recovery of any fine imposed in respect thereof.

EXTRACT FROM THE POST AND TELEGRAPH AMENDMENT ACT, 1922.

C 9. The authority conferred on the Governor-General in Council by Sub-section 3 of Section 3 of the Post and Telegraph Amendment Act, 1911, to make regulations with respect to licences for the installation and working of apparatus for wireless telegraphy shall be deemed to include power to make regulations with respect to any or all of the matters following, namely:—

(a) The revocation or suspension of any such licence by the Minister of Telegraphs, and the grounds of such revocation or suspension;

(b) The dismantling or confiscation of any such apparatus by or by direction of the Minister, and the grounds on which the powers of dismantling or confiscation may be exercised;

(c) The making by licensees or applicants for licences of declarations of secrecy, designed to prevent the unauthorised divulgence of wireless communications that may be intercepted in the course of the exercise of the privileges conferred by the licence;

(d) The imposition of penalties for any breach of the regulations or of the conditions of a licence, or of any declaration of secrecy;

(e) The prohibition or regulation of the use of apparatus which may generate electric waves likely to interfere with the conduct of public wireless communications.

REGULATIONS.

FOR CONTROL OF SHIPS CARRYING WIRELESS TELEGRAPH APPARATUS WHILE WITHIN TERRITORIAL WATERS OR HARBOURS OF NEW ZEALAND.

REGULATIONS.

D MADE BY ORDER IN COUNCIL UNDER THE AUTHORITY OF THE POST AND TELEGRAPH AMENDMENT ACT, 1913, AND AMENDED BY REGULATIONS MADE BY ORDER IN COUNCIL DATED 17TH JANUARY, 1923 FOR THE CONTROL OF SHIPS CARRYING WIRELESS TELEGRAPH APPARATUS WHILE WITHIN THE TERRITORIAL WATERS OR HARBOURS OF NEW ZEALAND.

1. In these regulations, if not inconsistent with the context:—

"Territorial waters of New Zealand" means and includes all tidal waters included within the Dominion of New Zealand, and all parts of the open sea within one marine league of the coasts of that Dominion measured from low-water mark.

"In harbour" means inside any harbour in New Zealand or within three miles of the entrance of any such harbour which a ship is about to enter or leave.

"Minister of Telegraphs" means the Minister of Telegraphs for the time being.

"Wireless telegraphy" has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

"Telegraph" has the same meaning as in section 119 of the Post and Telegraph Act 1908.

"Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

"The Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

"Coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

"Ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

"Message" means a telegram or other communication made by means of wireless telegraphy.

2. These regulations shall apply only to foreign merchant ships and to British merchant ships not registered in New Zealand, while such British or foreign ships are within the territorial waters of New Zealand, or in harbour.

3. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

SHIPS IN TERRITORIAL WATERS.

4. All apparatus for wireless telegraphy on board a merchant ship while in the territorial waters of New Zealand shall be worked in such a way as not to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established, installed, or worked, in the Dominion of New Zealand or the territorial waters thereof; and, in particular, the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established on ships at sea and wireless telegraph coast stations.

5. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the said apparatus, and it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the said apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service, and, subject thereto, for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

6. Any such officer or person may in such event as aforesaid, instead of taking possession of the said apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the said apparatus, either wholly or partly, and in such manner as he may direct and such persons may enter upon any ship on which the said apparatus is installed accordingly; or the said officer or person may direct the person or persons in charge of the said apparatus to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the said person or persons in charge of the said apparatus shall obey and conform to all such directions.

SHIPS IN HARBOUR.

7. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in harbour, except as herein-after provided or with the consent in writing of the Minister of Telegraphs.

(a) When the ship is in any harbour of the Dominion of New Zealand, but not berthed—i.e., out of touch with the land line telegraph system—the licensed apparatus may be used for the purpose of communicating, on minimum power, with the nearest coast station, or may be used in circumstances in which communication with the nearest coast station is impracticable, and where

the interest of navigation would be facilitated thereby, to establish communication with a more distant coast station, or, if necessary, with another ship station.

(b) In exceptional circumstances, such as the non-operation from any cause of the land line telegraph system, when the ship is in any harbour of the Dominion of New Zealand and berthed therein, the licensed apparatus may be used to communicate with the nearest coast station on matters affecting the interest of navigation. When it is impracticable to communicate with the nearest coast station, communication may be established with a more distant coast station, or, if necessary, with another ship station.

(Regulations 8, 9, 10, 11 and 12 revoked.)

PENALTIES.

13. If any breach of these regulations is committed by any person on board any ship while in the territorial waters of New Zealand or in harbour, the person so committing the same and the owner and master of the ship shall be severally liable on summary conviction to a fine not exceeding £100.

14. Whenever the Minister of Telegraphs or the Secretary of the Post and Telegraph Department has reasonable cause to believe or suspect that any breach of these regulations has been committed on board any ship while in the territorial waters of New Zealand, or in harbour, he may give notice in writing to the Collector of Customs at any port in New Zealand to detain the ship under section 9 of the Post and Telegraph Amendment Act, 1913, until the sum of £100, or such smaller sum as may be specified in the notice, has been deposited with the Collector by or on behalf of the owner of the ship.

15. If on the receipt of that notice, or at any time within three months thereafter, the ship is found within such port, the Collector of Customs shall withhold the certificate of clearance of the ship under section 35 of the Customs Act, 1913, until and unless the aforesaid sum is deposited with him or the aforesaid notice of detention is withdrawn.

15. If within six months after the date of the offence in respect of which the ship has been detained a conviction for that offence is obtained against any person, the sum so deposited shall be available for the satisfaction of any fine and costs imposed or awarded by the conviction, and the residue, if any, shall be returned to the person by whom or on whose behalf the deposit was made.

16. If within the period of six months aforesaid no such conviction is obtained, the sum so deposited shall be returned to the person by whom or on whose behalf it was deposited.

REGULATIONS AS TO SHIPS REGISTERED IN NEW ZEALAND BEING PROVIDED WITH WIRELESS TELEGRAPHY APPARATUS.

ORDER IN COUNCIL.

E At the Government House, at Wellington, this twentieth day of October, 1913.

Whereas it is enacted by Section 50 of the Shipping and Seamen Amendment Act, 1909, that the Governor may from time to time by Order in Council make regulations requiring ships registered in New Zealand, and carrying passengers, to be provided with apparatus for transmitting messages by means of wireless telegraphy, and may by such regulations prescribe fines not exceeding fifty pounds for any breach thereof by the owner or master of a ship. And whereas it is desirable to make such regulations:

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in exercise of the hereinbefore recited power and authority, and acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations, and doth hereby order that they shall come into force on July 1st, 1914:

Provided that, if in his opinion the circumstances justify it, the Minister of Marine may exempt any steamship from the operation of these regulations, and may limit the time for which any such exemption shall be in force.

REGULATIONS.

1. Every steamship registered in New Zealand, and carrying passengers, which is engaged in the foreign or inter-colonial trade, except steamships trading to the Chatham, Auckland, Campbell, and Antipodes Islands, and every home trade steamship which is authorised by her ordinary survey certificate to carry not less than 150 passengers at sea, shall not leave or attempt to leave any port in New Zealand unless such steamship is equipped with an efficient apparatus for radio communication in good working order, to be operated by a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night.

2. Ships required by these regulations to carry the apparatus prescribed above shall be placed in the third class as defined by Article XIII of the Detailed Service Regulations, appended to the International Radiotelegraph Convention, 1912—that is, they are not bound to perform any regular listening service.

3. The Minister of Marine may appoint inspectors for the purposes of these regulations, and such inspectors and superintendents of Mercantile Marine may visit any steamship required by these regulations to be equipped with apparatus for radio communication before they leave port, and ascertain if they are equipped with such apparatus the operation of which shall be carried on by a telegraphist holding a certificate as prescribed by Article X of the Detailed Service Regulations attached to the International Radiotelegraphic Convention.

4. Where a passenger steamship subject to these regulations is without the apparatus and the operator prescribed, and is about to attempt to leave port, an inspector or superintendent shall:—

(a) Notify the master of the fine to which he will be liable and of the particulars in respect of which the law has not been complied with;

(b) Notify at once the Collector of Customs, who may thereupon withhold the vessel's clearance until the requirements of these regulations are complied with;

(c) Prepare a report in writing of his action and transmit it to the Collector of Customs, who shall forward a copy to the Secretary of the Marine Department.

5. An inspector or superintendent may, at any time before a vessel subject to these regulations leaves port, require the master to give him a certificate, in the form set forth in the appendix hereto, that the wireless apparatus of his ship is sufficient and in good working order, and the master shall give such certificate before the vessel leaves port.

6. The power necessary to transmit signals shall at all times, while the vessel is under way be available for the wireless operator's use.

7. Subject to the above regulations, the installation and operation of the apparatus

required by them to be fitted shall be in conformity with the requirements of the Post and Telegraph Act, 1908, and its amendments, and the regulations made thereunder.

8. Any master or owner of a steamship committing a breach of these regulations is liable to a fine not exceeding £50.

APPENDIX.

This is to certify that the wireless operator in principal charge of the apparatus for radio-communication on the s.s. " " has this day certified to me in writing that the said apparatus is efficient and in good working order.

(Signed)

Master.

AMENDING REGULATIONS AS TO SHIPS BEING PROVIDED WITH WIRELESS TELEGRAPHY APPARATUS.

LIVERPOOL, Governor.

By His Deputy, ROBERT STOUT.

ORDER IN COUNCIL.

At the Government House at Wellington, this 8th day of June, 1914.

Present:

HIS EXCELLENCY THE GOVERNOR IN COUNCIL.

Whereas it is enacted by Section 50 of the Shipping and Seamen Amendment Act, 1909, that the Governor may from time to time by Order in Council make regulations requiring ships registered in New Zealand and carrying passengers, to be provided with apparatus for transmitting messages by means of wireless telegraphy, and may by such regulations prescribe fines not exceeding fifty pounds for any breach thereof by the owner or master of a ship:

And whereas regulations regarding certain ships being provided with apparatus for transmitting messages by means of wireless telegraphy were made by Order in Council dated the twentieth day of October, One thousand Nine hundred and thirteen, and published in the *New Zealand Gazette* of the Twenty-third day of the same month:

And whereas it is desirable to amend such regulations in the manner hereinafter described:

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in pursuance and exercise of the hereinbefore-recited power and authority, and of all other powers and authorities enabling him in that behalf, and acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby amend the said regulations by adding the following further proviso to the enacting portion of such regulations, viz.:—

"Provided further that, if in his opinion the circumstances justify it, the Minister of Marine may exempt steamships plying within any prescribed limits in the home trade from the operation of these regulations, and may, if he thinks fit, limit the time for which any such exemption shall be in force."

LICENCE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATION.

In pursuance and exercise of the power and authority conferred upon me by section 3 of the Post and Telegraph Amendment Act, 1911, and section 6 of the Post and Telegraph Amendment Act, 1920, I, Minister of Telegraphs of the Dominion of New Zealand, hereby grant a licence to for the installation and working of apparatus for wireless

SCHEDULE.

LICENCE FOR THE INSTALLATION AND WORKING OF APPARATUS FOR
WIRELESS TELEGRAPHY ON BOARD SHIPS OWNED BY

Name of Ship on which Station established.	Class of Ship Station under the Radiotele- graph Convention, 1912.	Call Signal.	Nature of Services performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.	Wavelengths (in Metres).	Power.		
					By Night.	By Day.			Source & Maxi- mum Output.	Maximum to be normally taken by Sending instru- ments.	If Alternato is used, Number of Cycles per Second.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

telegraphy (within the meaning of Part X of the Post and Telegraph Act, 1908), on board the ship or ships named in the Schedule hereto, and subject to the regulations providing for the working of wireless telegraphy on ship stations made by Orders in Council of the seventh day of September, 1914, and the seventeenth day of January, 1923, the provisions of which are printed hereon.

Given under my hand, at Wellington, this
day of , 19

Minister of Telegraphs.

Entered in the Register of Warrants of the
Minister of Telegraphs, this day of
, 19

Secretary, Post and Telegraph Department.

REGULATIONS.

1. In these regulations, if not inconsistent with the context:—

“Minister of Telegraphs” means the Minister of Telegraphs for the time being.

“Wireless Telegraphy” has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

“Telegraph” has the same meaning as in Section 119 of the Post and Telegraph Act 1908.

“Naval signalling” means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty’s Navy, between ships of His Majesty’s Navy and naval stations, or between a ship of His Majesty’s Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

“The Admiralty” means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

“The International Telegraph Convention” and the “International Telegraph Regulations” means respectively the International Convention of St. Petersburg dated the 10th-22nd July, 1875, and the service regulations made thereunder; and include respectively any modifications of the convention or regulations made from time to time.

“The Radiotelegraph Convention, 1912,” means the convention signed at London on the 5th day of July, 1912, and the service regulations made thereunder; and includes any modification of the convention or regulations made from time to time.

“Coast station” means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

“Ship station” means a wireless telegraph station established on board a ship which is not permanently moored.

“In harbour” means inside any harbour in New Zealand or within three miles of the entrance of any such harbour which a ship is about to enter or leave.

“Message” means a telegram or other communication made by means of wireless telegraphy.

“Telegram” has the same meaning as in section 119 of the Post and Telegraph Act, 1908.

2. The Minister of Telegraphs may, at the request of any person or company desirous of establishing, installing, working, and using on ships belonging to such person or company, and registered in New Zealand, apparatus for wireless telegraphy, grant to such person or company (hereinafter called “the licensee”) a licence, in the form of the Schedule hereto, for the period, upon the terms, and subject to the conditions and restrictions hereinafter appearing.

3. Each ship station is bound to exchange radiotelegrams with any coast station, or with any other ship station, without distinction as to the radiotelegraph system adopted by that station.

4. Each ship station shall be of such class mentioned in Article 13 of the Service Regulations annexed to the Radiotelegraph Convention, 1912, as is specified in the licence issued in respect thereof, and the equipment of the station, hours of duty observed, and other requirements shall be appropriate to such class in accordance with the provisions of the Radiotelegraph Convention, 1912.

5. The apparatus used at all ship stations shall, as far as possible, be in keeping with scientific and technical progress. The waves emitted must be as pure and as little damped as possible.

6. The apparatus must be capable of transmitting and receiving at a speed of at least equal to twenty words per minute, the word being reckoned at the rate of five letters.

7. The apparatus shall be so constructed as to be capable of using wavelengths of 600 to 300 metres as measured by the standard of measurement in use by the Post and Telegraph Department for the time being; and such other wavelengths not exceeding 600 metres as shall be authorised from time to time by the Minister of Telegraphs; Provided always that the wavelength of 600 metres shall normally be used for communication, and, further, that the wavelength of 1,800 metres may be used for transmission in the exceptional case referred to by Article 35 (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention, 1912; Provided, further, that only wavelengths of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged.

8. (1) The licensed apparatus shall not be used by the licensee, or by any other person either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by these regulations; and the licensee shall not, except as herein-after provided or with the consent in writing of the Minister of Telegraphs, send or receive messages from or at the licensed apparatus when in any harbour in the Dominion of New Zealand.

(2) When the ship is in any harbour of the Dominion of New Zealand, but not berthed—*i.e.*, out of touch with the land-line telegraph system—the licensed apparatus may be used for the purpose of communication, on minimum power, with the nearest coast station, or may be used in circumstances in which communication with the nearest coast station is impracticable, and where the interests of navigation would be facilitated thereby, to establish communication with a more distant coast station, or, if necessary, with another ship station.

(3) In exceptional circumstances, such as the non-operation from any cause of the land line telegraph system, when the ship is in any harbour of the Dominion of New Zealand and berthed therein, the licensed apparatus may be used to communicate with the nearest coast station on matters affecting the interests of navigation. When it is impracticable to communicate with the nearest coast station, communication may be established with a more distant coast station, or, if necessary, with another ship station.

9. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister of Telegraphs so to do, close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of the licence.

10. The licensee shall observe the International Telegraph Convention and International Telegraph Regulations so far as the

said convention and regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

11. The licensee shall observe the provisions of any regulations from time to time made under the provisions of the Post and Telegraph Act, 1908, and its amendments, by the Governor-General, in Council or by the Minister of Telegraphs in relation to the conduct of wireless telegraph business, so far as the same are applicable to the licensee.

12. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

13. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister of Telegraphs from time to time for the purpose of preventing interference with the working of any other wireless telegraph station, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

14. The licensed apparatus shall not, without the consent of the Minister of Telegraphs be altered or modified in respect of any of the particulars referred to in the licence issued in respect thereof, and such apparatus shall at all times be maintained in good working order.

15. Except as provided in these regulations, the licensee shall transmit messages by means of the licensed apparatus on equal terms, without favour or preference, whether as regards rates of charge, order of transmission, or otherwise.

16. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay, and with priority over all other messages, to the proper authorities by means of the licensed apparatus or by any other means in the power of the licensee.

17. The licensed apparatus at ship stations shall be worked only by a person or persons holding a certificate or certificates issued or recognised by the Minister of Telegraphs. Certificates shall be granted to persons of British nationality possessing the qualifications prescribed by the Radiotelegraph Convention, 1912, and shall be in such form and subject to such conditions, directions, or rules as the Minister of Telegraphs shall from time to time prescribe; and such certificate may at any time be withdrawn at the discretion of the Minister of Telegraphs in case of misconduct, or breach, on the part of the holder, of the Radiotelegraph Convention, 1912, or of any conditions, directions, or rules prescribed by the Minister of Telegraphs for the guidance of operators or for the working of such ship stations.

18. (1) The licensee, his servants and agents, shall not divulge the contents or the purport of the contents of any message, or make any use whatever of any message coming to his or their knowledge, other than to the addressee or his authorised agent, or to properly authorised officials of His Majesty's Government or of the Minister of Telegraphs, or to a competent legal tribunal.

(2) The licensee shall render to the Minister of Telegraphs such accounts as the Minister of Telegraphs shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the licensed ship stations

and coast stations and shall pay to the Minister of Telegraphs, at such times and in such manner as the Minister of Telegraphs shall direct, all sums which shall be due from the licensee under such accounts.

19. The licensee shall keep full accounts records, and registers of all messages transmitted by means of the licensed apparatus; and in such registers each of such messages shall be accompanied by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister of Telegraphs shall from time to time reasonably require to be shown. The licensee shall preserve all used message forms written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraph Convention, 1912, and, in default of any provisions on the subject in the said convention, for such period as is from time to time prescribed by the International Telegraph Regulations; and such registers and message papers shall be open to the inspection of the Minister of Telegraphs or his authorised officers.

20. The Minister of Telegraphs, and any agent authorised in that behalf in writing by him, may at all reasonable times enter upon any licensed ship station for the purpose of inspecting, and may inspect any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and user of such apparatus and telegraphic instruments.

21. The licensee shall carry on every ship on which a ship station is established a print or copy of the licence, certified under the hand of an appropriate officer of the Minister of Telegraphs to be a true copy, and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls, and also such documents as may be prescribed by the Minister of Telegraphs for the purpose of enabling the licensee to communicate with coast stations and ship stations, in accordance with the Radiotelegraph Convention, 1912.

22. (1) Every licence shall be in force from the date of the granting thereof until the 31st December of the year in which it is issued, and no longer; but may be renewed from year to year.

(2) The licensee shall pay to the Minister of Telegraphs for and in respect of the licence granted, and of every renewal thereof, a royalty of 5s. in respect of each ship station included in the licence.

(3) All royalties payable under any licence shall be payable on the date of the granting or renewal thereof, as the case may be.

23. Except with the consent in writing of the Minister of Telegraphs, the licensee shall not assign, underlet, or otherwise dispose of or admit any other persons or body to participate in the benefit of any licence.

24. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf

of His Majesty, and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

25. Any such officer or person may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly; or the said officer or person may direct the licensee, his servants or agents, to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the licensee, his servants or agents, shall obey and conform to all such directions.

26. In any of the following cases, that is to say:—

(a) In case any sum of money which ought to be paid by the licensee to the Minister of Telegraphs under or by virtue of these regulations shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case any breach, non-observance, of or non-performance by or on the part of the licensee, his servants or agents, of any of the provisions (other than a provision for the payment of money) or conditions herein contained,—

then and in any such case the Minister of Telegraphs may, by notice in writing, revoke and determine the licence as to all or any of the ship stations thereby licensed, and thereupon the said licence shall absolutely cease, determine, and become void as to all or any of the said ship stations, as the case may be, but without prejudice to any right of action or remedy which shall have accrued to His Majesty under these regulations or otherwise.

27. Nothing in these regulations shall prejudice or affect the right of the Minister of Telegraphs from time to time to establish, extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to those licensed hereunder or otherwise) in such manner as he shall in his discretion think fit. Neither shall anything herein contained prejudice or affect the right of the Minister of Telegraphs from time to time to enter into agreements for or to grant licences relative to the working and use of telegraphs (whether of a like nature to those licensed hereunder or otherwise) or the transmission of messages in any part of New Zealand by means of wireless telegraphy, or by any other means, with or to any person or persons whomsoever, upon such terms as he shall in his discretion think fit. And (save as in these regulations expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister of Telegraphs by or under the Post and Telegraph Act, 1908.

28. Any notice, request, or consent (whether required to be in writing or not) to be given by the Minister of Telegraphs under these regulations may be under the hand of the Secretary for the time being of the Post and Telegraph Department, and may be served by sending the same in a registered letter addressed to the licensee at the office or place of residence for the time being of the licensee, or, if such notice, request, or consent relates to any particular ship station, by delivery to the master of the ship upon which such station is installed; and any notice to be given by the licensee under these regulations may be served by sending the same in a registered letter addressed to the Secretary, General Post Office, Wellington.

29. All licences heretofore issued under the regulations hereby revoked shall continue in force, subject to the regulations under which they were issued, until the expiry of the current term thereof, but shall not be capable of renewal under the regulations so revoked.

POST AND TELEGRAPH DEPARTMENT
PROVISIONAL PERMIT ISSUED BY THE
MINISTRY OF TELEGRAPHS.

G AUTHORISING THE USE OF WIRELESS
RECEIVING APPARATUS FOR EXPERI-
MENTAL OR INSTRUCTIONAL PURPOSES
AS INDICATED HEREON.

PARTICULARS REGARDING PERMITTEE AND
APPARATUS.

Name of person to whom the permit is issued, and where applicable, the body on whose behalf the permit is held:—

Address:—

Location of apparatus:—

Purpose for which apparatus authorised (experimental or instructional):

THIS PERMIT authorises the person or body referred to herein to use for experimental/instructional purposes wireless receiving apparatus subject to the conditions hereinafter mentioned. The Permit is a provisional one and will subsequently be replaced, where circumstances justify the same, by a licence.

The Permit is subject to withdrawal or cancellation at any time when, in the opinion of the Minister of Telegraphs, such action becomes necessary.

Any breach of the conditions referred to will result in withdrawal of cancellation of the Permit and will be regarded *per se* as indicating the unfitness of the Permittee to receive a regular licence.

While it is the intention to give every reasonable facility to persons or bodies who are in any way likely to further the interests of wireless science or of radio communication, and who are not actuated solely by motives of amusement, it should be distinctly understood that the Minister of Telegraphs is charged *inter alia* with the responsibility for the uninterrupted carrying-on of the public radio services, for the secrecy of public radio correspondence, and for the reliable detection of Distress Signals upon which depends in a great measure the safety of life at sea. These facts render it imperative that the following conditions should be strictly observed, and Permittees are therefore enjoined to co-operate with the Post and Telegraph Department in every possible way with a view to ensuring the furtherance of the objects mentioned.

Secretary, Post and Telegraph Department.
Date

Signature of Permittee.

Witness:

Radio Inspector.

Date:

CONDITIONS UNDER WHICH PERMIT IS ISSUED.

1. "Radio Inspector" in this Permit means the District Telegraph Engineer of the district in which the wireless receiving station is situated, or such officer or officers as may be deputed by him. "Permittee" means the person in whose name the Permit is issued, and who is held responsible for the due observance of the following conditions:—

2. *Object of Permit.*—This Permit authorises the use of the wireless receiving apparatus described in Schedule A, or such modification thereof as may subsequently be approved in writing by the Radio Inspector.

3. *Alterations to Apparatus.*—Any change that is contemplated in the type or characteristics of the receiving apparatus referred to in Schedule A must first be notified in writing to the Radio Inspector and be accompanied where necessary by descriptive diagrams. These changes must not be effected until the written sanction of the Radio Inspector has been obtained. This precaution is necessitated mainly on account of the highly "interfering" properties of valve receivers operating under certain conditions, and it should be clearly understood by Permittees authorised to use valve receivers that serious interference may actually result from the same within a radius of ten miles of a public radio station.

4. *Amateur Warning Signal.*—When using valve receivers within ten miles of a Government Radio Coast Station, Permittees must continually listen for the Amateur Warning Signal from such station—*viz.*, A.A.A.A.Q.R.M. (followed by a figure indicating minutes), and must immediately cease operations upon receipt of the same until the time indicated has expired. In this connection the greatest care must be exercised on the part of the Permittee to avoid interfering with the receipt and handling by radio stations open for public correspondence of the International Distress Signal, SOS.

5. *SOS Signals: Procedure.*—If, in connection with his use of the authorised apparatus any Distress Signals should come under the notice of the Permittee, and there is reason to believe that such signals have not been intercepted by a radio station open to public correspondence, the Permittee shall immediately take such steps as may be available (*e.g.*, by telephone) for communicating the same to the nearest Government radio station, or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

6. *Custody of Apparatus.*—The wireless apparatus authorised by this Permit shall be kept in secure custody, and no part of the same shall be removed from its authorised location without the approval of the Radio Inspector.

7. *Inspection of Apparatus.*—The wireless apparatus shall be subject to inspection by the Radio Inspector at all times, and every facility shall be given to such officer to carry out any inspection or test that may be considered necessary.

8. *Supervision by Permittee.*—The apparatus shall not be brought into operation for any purpose in the absence of the Permittee or apart from his supervision, and in order to safeguard this requirement the Permittee must see that Condition 6, requiring the apparatus to be kept in safe custody, is faithfully observed.

9. *Declaration of Secrecy.*—The Permittee shall be required to execute a Declaration of Secrecy which provides that he shall not divulge to any unauthorised person any information relating to public radio correspondence

which may come to his knowledge, and that he will by every means in his power seek to preserve the secrecy of the same. Exception is made in the case of meteorological and time signals which are broadcasted for general information. Any breach of this condition will be seriously noticed. The Permittee shall not commit to writing any such public radio correspondence that may come to his knowledge, and shall be responsible for seeing that no unauthorised person is permitted to become acquainted with the same. In the case of bodies for whom the Permittee may be acting in a representative capacity, the latter shall be held responsible for satisfying the Radio Inspector that all members of the body having access to the apparatus shall first have executed the Declaration of Secrecy. The apparatus shall be regarded as under the direct supervision of the Permittee, but, in order to facilitate the work of such body, the responsibility of supervision may be shared with one or more approved persons, as may be arranged in writing with the Radio Inspector. These responsible supervisors shall be present whenever the apparatus is being used, and shall supervise such use with the object of ensuring that all the conditions of the Permit, particularly those relating to the Amateur Warning Signal, to Distress Signals, and to the secrecy of public correspondence, are strictly observed.

10. *Log Record.*—The Permittee shall keep a log record showing the hours during which the authorised apparatus is in operation and embodying a record or the reception of any of the special signals referred to in Condition 4. This log shall be produced for perusal by the Radio Inspector whenever required.

11. *Temporary Disuse of Apparatus.*—Apart from the requirements of Condition 4, the use of the apparatus shall cease at any time and for any period that may be considered necessary by the Radio Inspector.

12. *Amendment of Conditions.*—The Permittee shall be prepared and shall be required to comply with any amended or additional conditions that circumstances may from time to time render it necessary to impose.

SCHEDULE A.

DESCRIPTION OF WIRELESS RECEIVING APPARATUS AUTHORISED UNDER THIS PERMIT.

RADIOTELEGRAPH REGULATIONS FOR AMATEUR, EXPERIMENTAL AND BROADCASTING STATIONS.

JELLCOE, Governor-General.

ORDER IN COUNCIL.

At the Government Buildings at Wellington, the 17th day of January, 1923.

Present:

THE RIGHT HONOURABLE W. F. MASSEY, P.C.,
PRESIDING IN COUNCIL.

H In pursuance and exercise of the power and authority conferred on him by the Post and Telegraph Act, 1908, and its amendments, His Excellency the Governor-General of the Dominion of New Zealand, acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations in connection with the licensing of the installation and working of apparatus for radiotelegraphy; and doth direct that this Order in Council shall have effect from the date of its publication in the "*New Zealand Gazette*."

REGULATIONS.

INTERPRETATION.

1. In these regulations, if not inconsistent with the context:—

"The Admiralty" means the Commissioners for executing the office of Lord High Admiralty of the United Kingdom of Great Britain and Ireland;

"Amateur station" means a radio station licensed for the reception, or for the reception and transmission of radio communications other than public correspondence, and erected solely for personal interest or for experimental purposes;

"Antenna" means the electrical conductor or system of conductors used for receiving or emitting electro-magnetic waves;

"Apparatus" means and includes all equipment of every kind used in radio telegraphy;

"Broadcasting station" means a radio station licensed to broadcast for general information certain classes of radio communications specified in the licence;

"Coast station" means a radio station which is established on land or on board a ship permanently moored, and which is open for the service of public correspondence;

"Continuous waves" means waves which, after reaching the steady state, are periodic, i.e., the successive oscillations are identical;

"Damped waves" means waves consisting of successive wave trains in which the amplitude of the oscillations, after reaching a maximum, declines gradually;

"District Radio Inspector" means the District Telegraph Engineer of the District in which the radio station is situated;

"Deputy Radio Inspector" or "Assistant Radio Inspector" means such officer or officers of the Post and Telegraph Department as may, with the general approval of the Minister, be deputed from time to time by the District Radio Inspector to act on his behalf;

"Experimental station" means a radio station licensed for the reception, or for the reception and transmission of radio communications intended to promote investigations of a scientific character;

"Government station" means any radio station at which radio communications are transmitted or received by means of radio telegraphy, and which is operated by any Government Department or by the Admiralty;

"Licensee" means any person, association, or corporation to whom a licence for a radio station is granted in pursuance of these regulations;

"Minister" means the Minister of Telegraphs for the time being;

"Naval signalling" means signalling by means of radiotelegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval station and any other radio station;

"Operator" means any person to whom an amateur operator's certificate is issued in pursuance of these regulations;

"Public correspondence" means any radio communication transmitted by or intended for a Government station or any licensed radio station other than an amateur, experimental, or broadcasting station, except such radio communications as may be broadcasted for general information;

"Radio communication" means any communication, message, or signal propagated by means of radio telegraphy;

"Radio Inspector" means such officer or officers of the Post and Telegraph Department as shall from time to time be appointed by the Minister to act in that capacity;

"Radio station" means any station where radio communications are transmitted or received by means of radio telegraphy;

"The Radio Telegraph Convention, 1912" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made therein; and includes any modification of the Convention or regulations made from time to time;

"Radio telegraphy" means every system of electrical communication utilizing radio frequencies with or without the use of conductors to connect the signalling points, and includes therein all systems of radiotelephony;

"Ship station" means a licensed station established on board a ship which is not permanently moored.

GENERAL.

2. The Minister may, at the request of any person, association or corporation, desirous of establishing, installing, working, or using apparatus for radiotelegraphy for amateur, experimental, or broadcasting purposes, grant to such person, association or corporation, a licence in the form of the Schedule hereto for the period, upon the terms, and subject to these regulations, and to such conditions and restrictions, not inconsistent with such regulations, as the Minister may impose from time to time.

3. Subject to these regulations, no person shall operate a radio station for which any such licence is granted unless he is the holder of an amateur operator's certificate which may be issued in pursuance of these regulations.

4. Any of the powers or authorities given to the Minister by these regulations may be delegated by him to such officer or officers of the Post and Telegraph Department as he thinks fit.

5. A Radio Inspector may exercise any of the powers conferred by these regulations on a District Radio Inspector; and a Deputy Radio Inspector or an Assistant Radio Inspector may exercise such of the powers of a District Radio Inspector as that officer may, with the general approval of the Minister, delegate to him.

RADIO DISTRICTS AND RADIO INSPECTORS.
6. For the purposes of these regulations the mainland of New Zealand shall be divided into four (4) radio districts, which shall be identical with the telegraph and telephone districts superintended by District Telegraph Engineers. These radio districts shall be classified as follows:—

- | | |
|-----------------|-----------------|
| (1) Auckland | (3) Canterbury. |
| (2) Wellington. | (4) Otago. |

Chatham Islands shall be included in the Wellington Radio District, and Stewart Island shall be included in the Otago Radio District.

District Radio Inspectors of the above-mentioned radio districts shall be respectively the District Telegraph Engineers, Auckland, Wellington, Christchurch, Dunedin.

7. The following shall each constitute a separate radio district classified as under:—

- | | |
|--------------------|-------------------|
| (5) Western Samoa. | (6) Cook Islands. |
|--------------------|-------------------|

The radio Inspectors of these districts shall be respectively the Superintendents of the coast stations Radio-Apia and Radio-Rarotonga, and such other officer or officers as may be appointed by the Minister.

8. Intending applicants should make inquiries to the nearest District or Deputy Radio Inspector where doubt exists as to the radio district in which the proposed radio station is located,

APPLICATIONS.

9. Intending applicants for a licence to erect or operate an amateur, experimental, or broadcasting station should, in the first instance, apply to the nearest District or Deputy Radio Inspector, who will furnish any needed advice and supply forms of application.

10. Every applicant for any such licence or for an operator's certificate shall furnish to the satisfaction of the Minister such technical or other information as may be required by him; and, in addition thereto:—

- (a) Evidence of British nationality;
- (b) A reference as to character from a reputable citizen not related to the applicant;
- (c) Date and place of birth;
- (d) Full name and address;
- (e) Information as to whether the licence is required on his own behalf or on behalf of an association or corporation; and
- (f) A statement as to the purpose of the proposed radio station.

11. The required information having been inserted on the proper form, the application shall be signed by the applicant and verified by a statutory declaration made by him.

12. The application shall then be forwarded to the nearest District Radio Inspector who shall satisfy himself as to the qualifications of the applicants and will then despatch the applicant to headquarters for consideration.

Should the application be approved, the applicant will be notified that he may proceed to erect a station. Upon the completion of the erection notification to that effect shall be sent to the District Radio Inspector. Where deemed necessary the District Radio Inspector shall inspect the station to determine whether it fulfils the requirements of the regulations. If, in his opinion, the station complies with the regulations and is satisfactory in all respects, the District Radio Inspector shall issue a licence accordingly. The licensee may then, and not until then, operate the station or permit the station to be operated strictly in accordance with these regulations.

13. Where it is impracticable for the District Radio Inspector to have the completed radio station inspected within a reasonable time, and where he has reason to believe that the regulations have been complied with, he may issue a temporary permit for the operation of the station in accordance with these regulations until it is duly inspected and approved.

LICENCES AND OPERATOR'S CERTIFICATES.

14. The licence shall specify all the information necessary to the identification of the licensee and of the licensed radio station, and, in addition, shall include technical particulars of the radio station and of the power, wavelength and types of transmission authorised therein.

15. The licence for a radio station shall remain in operation for a period of twelve months from the date of issue.

16. An application for renewal of a licence for a radio station shall be made through the District Radio Inspector on the form provided for the purpose, and shall be accompanied by the amount of the annual fee for the ensuing period.

17. An amateur operator's certificate is not transferable; and the licence for a radio station shall not be transferred except upon the approval of the Minister.

18. In the event of the loss, mutilation or destruction from any cause of an amateur operator's certificate or of a licence for a radio station, application for a duplicate should be made to the District Radio Inspector, and the

applicant shall forward a statutory declaration setting out the circumstances connected with the loss, mutilation or destruction of the certificate or licence.

The application shall be investigated by the District Radio Inspector who will forward the same to headquarters for consideration. If it be decided to issue a duplicate, the certificate or licence shall be endorsed "duplicate" across the face. A fee of 5s. shall be payable for the duplicate certificate or licence.

19. The holder of an amateur apparatus certificate shall be required, during the holding of the said certificate, to maintain his proficiency in the subjects covered by the certificate, and where a District Radio Inspector has reason to believe that this regulation is not being complied with, and the non-compliance therewith is inimical to the public interest, he may order a re-examination of the holder of the amateur operator's certificate with a view to it being determined whether the said certificate should be suspended or revoked by the Minister; and the Minister may take action accordingly.

20. The Minister may, at his discretion, revoke or suspend for such period as he deems fit any operator's certificate or any licence for a radio station where it is found that the operator or licensee at the date the certificate or licence was granted to him was ineligible or has since become ineligible for a certificate or licence, or where in his opinion the provisions of the regulations governing the issuance of a certificate or licence have been disregarded or violated, or where undue interference with the operation of any Government coast or ship station is found to result; the Minister may further order the confiscation or dismantling of the licensed apparatus in cases where, in his opinion, such action is warranted.

21. A licence shall not be granted for any radio station the operation of which, in the judgment of the Minister is likely unduly to interfere with the operation of any Government coast or ship station, or for any radio station, the erection and operation of which would in the judgment of the Minister, be inimical to the public interest.

22. The applicant for a licence for a radio station or for an operator's certificate shall be a British subject.

23. The applicant for a licence or for an operator's certificate shall have attained the age of fourteen years.

FEES AND CHARGES.

24. The annual fee to be paid in respect of licences issued by the Minister for the installation and operation of any class of radio station shall be as follows:—

(1) An amateur station for reception only (including reception from broadcasting stations) ..	5 0
(2) An amateur transmitting and receiving station, Grade II ..	£1 0 0
(3) An amateur transmitting and receiving station, Grade I ..	2 0 0
(4) An experimental transmitting and receiving station ..	3 0 0
(5) A private broadcasting station ..	2 0 0
(6) A toll broadcasting station ..	5 0 0

25. The fees to be paid in respect of examinations for an amateur operator's certificate, shall be as follows for each examination or re-examination:—

(1) Amateur Operator, Grade I.	5s.
(2) Amateur Operator, Grade II.	5s.

26. The fee to be paid in respect of a duplicate of an amateur operator's certificate, or of a radio station licence shall be 5s.

27. Where payment of the above-mentioned fees is not made on the due date the Minister shall not issue the said licence or certificate or, if issued, shall suspend or revoke the same as he may deem proper; provided that in the case of a recognised educational institution carrying out research work calculated to benefit the science of radio telegraphy, the Minister may, at his discretion, remit the annual licence fee.

CLASSIFICATION OF TRANSMITTED WAVES.

28. For the purpose of these regulations the various types of emissions are classified as under:—

(Type A.1) Continuous waves, key modulated; meaning continuous waves of which the amplitude or frequency is varied by the operation of keying as in telegraph transmission.

(Type A.2). Continuous waves, modulated at audio-frequency; meaning continuous waves in which the amplitude or frequency is varied in aperiodic manner at an audible frequency and commonly referred to as I.C.W.

(Type A.3). Continuous waves modulated by speech; meaning continuous waves in which the amplitude or frequency is varied according to the characteristic vibrations of speech.

(Type B.). Damped waves; this includes waves from spark transmitters or other types of transmitters having a characteristic decrement similar to the spark transmitters.

DAMPED WAVES (TYPE B.).

29. The use of damped waves is prohibited, except for research work on approved lines and subject to special written consent.

CALL SIGNAL.

30. Every radio station licensed hereunder to transmit radio communication shall, for purposes of identification, be allocated an official call signal by which the station shall be identified and which is to be used in the manner hereinafter given whenever a radio communication is caused to be transmitted from the said radio station.

31. For the transmission of any radio communication to any other licensed radio station, the procedure governing communications between ship stations and ship stations or ship stations and coast stations and outlined in article 25, sections 1 and 2 of the Detailed Service Regulations appended to the Radio Telegraph Convention, 1912, shall apply.

32. Where the transmissions are of an experimental character and not addressed to any specific station, the call signal shall be sent thrice, both at the commencement and at the close of each radio communication or connected series of radio communications.

33. The scheme of allocation of call signals shall be:—

(a) For a broadcasting station the number of the radio district in which the station is situated followed by the letter "Y" and one or more identification letters, e.g., 1-YA 3 YKG.

(b) For an amateur station, the number of the radio district in which the station is situated followed by two or more identification letters—e.g., 1 AA, 4 BOM.

(c) For an experimental station, the number of the radio district in which the station is situated followed by the letter X and one or more identification letters—e.g., 2 XAD, 3 XTU.

34. Any licensee or operator who impersonates any other licensee or operator, or who improperly uses the call signal of another radio station, commits an offence against these regulations.

DECLARATION OF SECRECY.

35. Every licensee (other than an association or corporation) and every operator shall execute a declaration of secrecy to the effect that he will not divulge to any unauthorised person any information whatsoever relating to public correspondence that may come to his knowledge; and that he will by every means in his power seek to preserve the secrecy of the same. Such licensee or operator shall not commit to writing any public correspondence that may come to his knowledge, while exercising the powers conferred upon him by the licence. In the case of societies, institutes and similar bodies, all members of the body, having access to the apparatus shall execute the declaration of secrecy, and special care shall be taken to ensure that all the conditions of the licence, particularly those relating to secrecy of public correspondence, are strictly observed.

CONTROL OF RADIO STATION IN EMERGENCY.

36. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of radio communications by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army or for any other person authorised in that behalf by the Admiralty or by the Minister, to take possession of or to dismantle or to cause the licensed apparatus or any part thereof to be taken possession of or to be dismantled in the name and on behalf of His Majesty, and to be used where such use may be deemed necessary for His Majesty's service, and subject thereto for such ordinary services as the said officer or person may deem fit; and in that event, any person authorised by the said officer or person may enter any radio station in which any such apparatus is installed and take possession of or dismantle the said apparatus and use the same as aforesaid.

INSPECTION DURING CURRENCY OF LICENCE.

37. The radio station must be open to inspection at all times by a District Radio Inspector, and every reasonable facility given for ascertaining the condition of the station and whether the regulations are being strictly complied with.

38. The licence of the radio station and the operator's certificate shall at all times be exhibited in a prominent place at the radio station.

NATURE OF RADIO COMMUNICATIONS.

39. A radio station licensed under these regulations shall not be used in any way to compete with Government communications services, and shall not transmit or receive radio communications, the transmission or reception of which is calculated in the judgment of the Minister to cause a loss of revenue to the Post and Telegraph Department.

40. The licensee or the operator shall not transmit any radio communication of a seditious, profane, obscene, libellous, or offensive nature.

41. The licensee or the operator shall not transmit any radio communication of a false or misleading character, and in particular shall not transmit any false SOS signal.

TRANSMITTING STATIONS TO BE EQUIPPED FOR RECEPTION.

42. An amateur experimental or broadcasting station shall be equipped for reception as well as for transmission, and shall observe the prescribed conditions relating to the keeping of

a watch for the interference warning signal AAAAQRN; provided that this requirement may be waived by the Minister in the case of a broadcasting station, communication with which can be conveniently obtained by an adjacent coast station by means of a government telephone exchange connection.

INTERFERENCE.

43. The licensed radio station shall at all times be operated in such a manner as to avoid interference with other radio stations and in particular with Government and coast and ship stations. In this connection radio stations shall be guided by the principles laid down in Sections 1 and 2A of Article 7, and Sections 3, 4 and 5, of Article 24, of the Detailed Service Regulations appended to the Radio Telegraph Convention, 1912. Amateur and experimental transmissions shall be as brief as possible, and the duration of individual transmissions shall not exceed five minutes. Transmitters shall be disconnected from the radiating system when not actually in use for the transmission of signals.

44. Except where otherwise provided, licensees or operators of broadcasting stations and of amateur and experimental transmitting stations must, after every transmission or short series of transmissions, listen for the interference warning signal AAAAQRN (here follows a number indicating minutes), and transmitted by a Government station on 600 metres, and must immediately cease transmission upon receipt of the same until the time indicated has expired. The greatest care must be exercised in this connection on the part of the licensee or operator to avoid interfering with the receipt and handling by Government, coast, or ship stations of the international distress signal, SOS (•••—•••), and of any radio communications that may be exchanged in connection therewith.

45. All the technical provisions of the licence of a radio station relating to power, wavelength, type of transmitter, and the like, shall be faithfully observed, and no unauthorised variation shall be made therein; and the station shall at all times be maintained at the highest possible degree of efficiency and selectivity.

SOS SIGNALS.—PROCEDURE.

46. If, in connection with his use of the authorised apparatus, any distress signal should come under the notice of the licensee or operator, and there is reason to believe that such signal has not been intercepted by a Government, a coast or a ship station, the licensee or operator shall immediately take such steps as may be available (e.g., by telephone) for communicating, the same to the nearest Government station or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

TEMPORARY PERMITS FOR DEMONSTRATIONS.

47. In cases where temporary authority is sought for demonstrations of radiotelegraphy in connection with lectures, scientific proceedings, or the like, the Minister may, at his discretion, grant the necessary permission. Every care shall be taken to safeguard the secrecy of public correspondence, and only in special cases shall permission be given to operate transmitting apparatus connected to an antenna or earth.

LOG RECORD.

48. The licensee of a radio station licensed for transmission shall keep a log record showing the hours during which the authorised transmitting apparatus is in operation, and embodying a record of the reception of any special signal referred to in Regulation 46. This log shall be produced for perusal by the District Radio Inspector whenever required.

MISCELLANEOUS STATIONS.

49. Schools, colleges, institutes, societies and like bodies shall, in accordance with the object in view, be classified by the Minister in one or other of the amateur or experimental grades.

50. Portable radio stations shall be classified by the Minister in one or other of the amateur or experimental grades, and shall be subject to such additional conditions regarding field of operation and the like as the Minister may deem it necessary to impose.

ANTENNAE.

51. For experimental or research purposes, where communication with another station is not essential to the object in view, use shall be made as far as possible of transmitting circuits which do not radiate energy, or the radiation from which is reduced to a minimum.

52. No limitations shall be imposed regarding the type or dimensions of a transmitting antenna; provided that the requirements as to operating wavelengths are strictly complied with, and that no interference is caused with the operation of other radio stations by reason of the type or dimensions of antenna employed.

SPECIAL REGULATIONS GOVERNING AMATEUR TRANSMITTING STATIONS.

53. Licences for amateur transmitting stations shall be divided into two grades according to the purpose for which the station is intended and to the qualifications of the applicant.

54. A Grade I amateur transmitting station licence shall be granted to amateurs with a sufficient knowledge of or past experience in radiotelegraphy and or furnishing satisfactory testimonials from some recognised scientific or technological person or institution, and holding in addition a Grade I amateur operator's certificate; but in the case of an association or corporation the licensee, not being in possession of such a certificate, may employ a person holding an amateur operator's certificate of Grade I, or a certificate of a higher class, to operate the said station.

55. A Grade I amateur station shall be operated by a person holding a Grade I amateur operator's certificate, the qualifications for which are as follows:—

Proficiency in Morse operating, both sending and receiving, at the rate of ten (10) words per minute, five (5) letters comprising a word; an adequate knowledge of the principles and adjustment of the authorised radio apparatus and of the laws and regulations relating to the operation and conduct of amateur stations.

56. The following transmitting wavelengths shall, at the discretion of the Minister, be available for allocation to Grade I amateurs, but only such wavelengths shall be employed at any station as are specified in the station licence:—

- (A) A general wave for all classes of service excepting Type B (damped waves) 150 metres.
- (B) A band of waves for radio telephony (Type A3) .. 151-160 ..
- (C) A band of waves for I.C.W. (Type A2) .. 161-170 ..
- (D) A band of waves for C.W. key modulated (Type A1) 171-180 ..

57. At the discretion of the Minister the power permitted to Grade I amateur stations shall be 50 watts or under according to the qualifications and aims of the applicants. The power rating of radio transmitters shall be as determined by the Minister.

58. In cases where approved research work is being undertaken which would be facilitated by an extension of the powers conferred in the Grade I amateur station licence, the Minister shall, at his discretion, grant such temporary privileges as, in his opinion, may be necessary to cover the object in view.

59. A Grade II amateur station licence shall be granted to amateurs not possessing the requisite knowledge or experience in radio telegraphy to entitle them to a Grade I licence, but whose aims and qualifications are such as to justify the issuance of an amateur station licence, Grade II, and who hold, in addition, a Grade II amateur operator's certificate; but in the case of an association or corporation, the licensee not being in possession of such a certificate may employ a person holding an amateur operator's Grade II, or a certificate of a higher class to operate the said station.

60. A Grade II amateur station shall be operated by a person holding a Grade II amateur operator's certificate, or a certificate of a higher class. The qualifications for a Grade I amateur operator's certificate are as follows:—

Proficiency in Morse operating, both sending and receiving; at the rate of eight (8) words per minute, five (5) letters or figures comprising a word; an adequate knowledge of the principles and of the adjustment of the authorised radio apparatus, and the laws and regulations relating to the operation and conduct of amateur stations.

61. For Grade II amateur transmissions, a general wave of 140 metres shall be used for all types of waves, excepting damped waves (Type B), which are prohibited.

62. The maximum power permitted to Grade II amateur stations shall be five watts. The power rating of radio transmitters shall be as determined by the Minister.

63. Amateur transmissions shall not be made between the hours of 7 p.m. and 8 p.m. NZMT. The Minister may, at his discretion from time to time, impose such further restrictions as to the hours of transmission as he may deem necessary.

SPECIAL REGULATIONS AS TO AMATEUR RECEPTION (INCLUDING RECEPTION FROM BROADCASTING STATIONS).

64. The range of wavelengths for reception is unlimited.

65. The type and dimensions of an antenna intended for reception only are not limited by these regulations.

66. In the interest of radiotelegraphy generally the types of receiving circuits authorised by the licence shall not include those which, in the judgment of the Minister, unduly energise the receiving antenna. (*Note*.—An example of such types is that in which one coil of a two-coil tuner is used as a reaction coil inductively couple to the antenna coil).

SPECIAL REGULATIONS AS TO BROADCASTING STATIONS.

67. For the purposes of these regulations, broadcasting stations are classified as follows:—

- (A) "Private broadcasting stations" at which no charge is made for the broadcasting of radio communications;
- (B) "Toll broadcasting stations" at which a charge is made for the transmission of the broadcasted radio communications.

68. A licence for a broadcasting station may be granted to persons who, in the judgment of the Minister are qualified satisfactorily to conduct such a station in accordance with the requirements of these regulations.

69. The licensee of a broadcasting station shall not operate the said station unless he holds an amateur operator's certificate, Grade I, or a certificate of a higher class, which has been endorsed to authorise broadcasting operations; but the licensee not being in possession of such a certificate may employ an approved person holding a similar certificate so endorsed to assist in the operation of the said station; provided that in certain cases the requirements as to Morse operation shall be waived as indicated in regulation 42.

70. Broadcasting stations shall be classified and controlled by the Minister in such a manner as shall, in his judgment, reduce to a minimum mutual interference between adjacent broadcasting stations and render the service as widely available as possible.

71. At the following and/or at such other broadcasting centres as may be decided upon by the Minister the normal power of a broadcasting station shall be $\frac{1}{2}$ kilowatt and the wavelengths of transmission shall be as indicated hereunder or as may be varied by the Minister from time to time:—

metres.		metres.
Whangarei .. 330	Wellington .. 275	
Auckland .. 260	Nelson .. 335	
Hamilton .. 360	Greymouth .. 265	
New Plymouth 385	Christchurch .. 380	
Gisborne .. 335	Timaru .. 330	
Napier .. 380	Dunedin .. 370	
Palmerston North 340	Invercargill .. 270	

72. At the following and/or at such other broadcasting centres as may be decided upon by the Minister the normal power of a broadcasting station shall be $\frac{1}{4}$ kilowatt and the wavelengths of transmission shall be as indicated hereunder, or as may be varied by the Minister from time to time:—

Metres.		Metres.
Kaitia .. 220	Wanganui .. 220	
Dargaville .. 190	Dannevirke .. 250	
Thames .. 195	Masterton .. 195	
Tauranga .. 225	Westport .. 195	
Rotorua .. 190	Kaikoura .. 220	
Whakatane .. 250	Oamaru .. 220	
Te Kuiti .. 240	Queenstown .. 190	
Taumarunui .. 210	Roxburgh .. 250	
Hawera .. 190	Gore .. 195	
Hastings .. 195		

73. The power rating of the radio transmitter of a broadcasting station shall be as determined by the Minister.

74. The antenna of a broadcasting station shall not be subject to restriction; provided the requirements as to operating wavelengths are strictly complied with and that no inherent interference is caused with the operation of other radio stations by reason of the type or dimensions of the antenna employed.

75. Where only one broadcasting station is licensed as a broadcasting centre the operating hours shall, subject to discretion of the Minister, be unlimited, but where more than one broadcasting station is licensed to operate at the same broadcasting centre, the Minister shall determine the hours of operation and shall be guided therein by consideration of the public interest.

76. On Sundays during the hours of 11 a.m. to 12.30 p.m. and 6.30 p.m. to 8 p.m. NZMT, priority shall be given to the broadcasting of religious services and kindred matter.

77. Subject to the provisions of regulation 78, neither direct nor indirect advertising shall be undertaken by broadcasting stations.

78. At the commencement of each separate item the broadcasting station shall repeat its call signal three times; and in addition thereto may announce the full name and address of the broadcasting station and make brief remarks relevant to the matter about to be transmitted.

79. Broadcasting stations shall not be used for the dissemination of propaganda of a controversial nature, but shall be restricted to matter of an educative or entertaining character such as news, lectures, useful information, religious services, musical or elocutionary entertainment, and such other items of general interest as may be approved by the Minister from time to time. The licensee of a broadcasting station shall not transmit radio communications, which, in the judgment of the Minister, do not come within the authority of this regulation, or do not conduce to the public interest.

SPECIAL REGULATIONS AS TO EXPERIMENTAL TRANSMITTING STATIONS.

80. A band of wavelengths from 390 to 410 metres shall, at the discretion of the Minister, be available for allocation to experimental stations, but only such wavelengths as are specified in the station licence shall be employed.

81. The normal power of an experimental station shall be 50 watts, the power rating of a radio transmitter shall be as determined by the Minister.

82. In cases in which an approved investigation is being undertaken which would be facilitated by an extension of the powers conferred in the experimental station licence, the Minister may, at his discretion, grant such temporary privileges as, in his opinion, may be necessary to cover the object in view.

83. An experimental transmitting station licence shall be granted only to a person of recognised attainments in the theory or practise of radiotelegraphy or to a body engaged in conducting experiments for the development of the science of radiotelegraphy.

84. The licensee of an experimental transmitting station shall not operate the said station unless he holds an amateur operator's certificate, Grade I, or a certificate of a higher class, but the licensee, not being in possession of such a certificate, may employ a person holding an amateur operator's certificate, Grade I, or a higher class, to assist in the operation of the said station.

85. The hours of transmission of experimental stations shall be as determined by the Minister

PENALTIES.

86. Every licensee or operator who acts in contravention of or commits an offence against any of the provisions of regulations 34, 35, 40 or 41, shall be liable to a fine of £50 or to imprisonment for six months.

87. Every licensee or operator who act in contravention of or commits an offence against any of these regulations for which a penalty is not hereinbefore provided, shall be liable to a fine of £10 or to imprisonment for three months.

LICENCE TO ERECT AND OPERATE AN AMATEUR RADIO STATION FOR RECEPTION ONLY.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraphs Act, 1908, and the Post and Telegraph Amendment Acts, 1911,

1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the 1922, for amateur, experimental and broadcasting stations, M is hereby licensed to erect an amateur station for the reception only, the said station (which is described in the schedule appended hereto) being situate at

in the radio district of ; and to operate the said station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned, or such amendments and additions as may hereinafter be gazetted and, in addition thereto, shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.

Signature of licensee.

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issued in accordance with regulation 12.

Date: District Radio Inspector.

LICENCE TO ERECT AND OPERATE AN EXPERIMENTAL RADIO STATION.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

J In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the 1922, for amateur, experimental and broadcasting stations, M is hereby licensed to erect an experimental station, the said station (which is described in the schedule appended hereto) being situate at in the radio district of and to operate the said experimental station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, watts.

7. Operating wavelength.

8. Authorised hours of transmission.

9. No. of operator's certificate.

(Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issued in accordance with Regulation 12.

Date: District Radio Inspector

LICENCE TO ERECT AND OPERATE AN AMATEUR RADIO TRANSMITTING AND RECEIVING STATION, GRADE....

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

K In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the 1922, for amateur, experimental and broadcasting stations M is hereby licensed to erect an amateur transmitting station Grade the said station (which is described in the schedule appended hereto) being situate at in the radio district of , and to operate the said amateur station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs,

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, watts.
7. Operating wavelength.
8. Authorised hours of transmission.
9. No. of operator's certificate.

Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provision of regulation 66.

Licence issued in accordance with Regulation 12.

Date: District Radio Inspector.

LICENCE TO ERECT AND OPERATE A RADIO BROADCASTING STATION.

DOMINION OF NEW ZEALAND.

POST AND TELEGRAPH DEPARTMENT.

Registered No. (This licence expires)

L In pursuance and exercise of the powers and authority conferred upon the Minister of Telegraphs by the Post and Telegraph Act, 1908, and the Post and Telegraph Amendment Acts of 1911, 1920 and 1922 respectively, and by the regulations made by the Governor-General in Council on the 1922, for amateur, experimental and broadcasting stations, M is hereby licensed to erect a

broadcasting station, the said station (which is described in the schedule appended hereto) being situate at . . . in the radio district of . . . and to operate the said broadcasting station for a period of twelve calendar months from the date hereof. The installation and operation of such radio station shall be carried out in accordance with the provisions of the regulations aforementioned or such amendments and additions as may hereinafter be gazetted, and in addition thereto shall be subject to such further restrictions and conditions as may from time to time be notified by the Minister of Telegraphs.

For the Minister of Telegraphs.

Secretary, or Chief Telegraph Engineer.

SCHEDULE OF THE AUTHORISED RADIO STATION.

1. Name of licensee.
2. Location of station.
3. Call signal.
4. Types of transmission authorised.
5. Type of transmitter.
6. Power, watts.
7. Operating wavelength.
8. Authorised hours of transmission.
9. No. of operator's certificate.
10. Classification of station.
11. Nature of authorised communications.

(Signature of licensee.)

Note.—No receiving circuit may be used which contravenes the provisions of regulation 66.

Licence issued in accordance with Regulation 12.

Date . . . District Radio Inspector.
F. D. THOMSON,
Clerk of the Executive Council.

SAMOA POST AND TELEGRAPH AMENDMENT ORDER, 1923.

JELlicoe, Governor-General.

ORDER IN COUNCIL.

At the Government House at Wellington, this 12th day of February, 1923.

Present.

HIS EXCELLENCY THE GOVERNOR-GENERAL IN COUNCIL.

M His Excellency, the Governor-General of the Dominion of New Zealand, acting by and with the advice and consent of the Executive Council of that Dominion, and in pursuance of the authority to make regulations for the peace, order, and good government of the Territory of Western Samoa conferred upon him by the Samoa Act, 1921, and of all other powers and authorities enabling him in that behalf, doth hereby order as follows:—

1. This Order may be cited as the Samoa Post and Telegraph Amendment Order, 1923, and shall be read with and form part of the Samoa Post and Telegraph Order, 1920.

2. This Order shall come into force on the first day of March, one thousand nine hundred and twenty-three.

3. Notwithstanding anything to the contrary in the Samoa Post and Telegraph Order, 1920, the Radio Telegraph Regulations for Amateur Experimental and Broadcasting Stations, as published in the *New Zealand Gazette* of the eighteenth day of January, one thousand nine hundred and twenty-three, shall, subject to the provisions of this Order, apply to Samoa in the same manner as if that territory was part of New Zealand.

4. Clause 10 (a) and clause 22 of the said regulations shall have no force or effect in Samoa.

5. All powers conferred by the said regulations on the Minister of Telegraphs shall in Samoa be exercised by the Administrator, and all references in the said regulations to the Minister of Telegraphs, or to the Secretary, or to the District Radio Inspector, shall for the purposes of this Order be read as references to the Administrator, the Secretary to the Administration or the Superintendent, Apia Radio Station, as the case may be.

F. D. THOMSON.

Clerk of the Executive Council.

NICARAGUA

(See Map 44)

CONTROL.

THE control of wireless telegraphy and telephony is in the hands of the Government, under the direction of the Minister of Public Works and the Director-General of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
General Fernando Solórzano	Minister for Public Works	Managua.
Mr. Paulino Solórzano . .	Director-General of Communications	Managua.

ORGANISATION.

With regard to wireless telegraphy, none of the installations at present existing in Nicaragua is owned by the Government. The United States Government possesses a station in Managua, the capital of the Republic, and

there are two stations owned by private companies on the Atlantic Coast. These stations (with the exception of that owned by the American Government) have been erected under contract with the Government of the Republic, and are subject to the provisions of the London Radiotelegraphic Convention of 1912. Only one of them is open to public service with ships.

Another wireless station, which will be erected in, or in the neighbourhood of the town of Managua, will be used for public correspondence for both land and ship stations.

A receiving station has been installed at the Administration General of Communication for press and time (75 meridian) messages.

ADMINISTRATION.

The Nicaraguan Government has granted a concession to the Tropical Radio Telegraph Co. for the installation and exploitation of wireless stations in the country for public use.

NIGERIA

(See Maps 24 and 26)

CONTROL AND ORGANISATION.

THERE is only one wireless station in Nigeria—at Lagos—erected by the African Direct Telegraph Company in 1912. It is open to public service with ships. The Postmaster-General controls the wireless services.

There are no wireless societies or clubs, nor are any licences issued for private stations.

ADMINISTRATION.

Wireless telegraphy is administered under:—

A—The Wireless Telegraph Ordinance, 1916.

B—Regulations made under the Ordinance of 1916.

THE WIRELESS TELEGRAPHY ORDINANCE, 1916.

A 1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1916.

2. *Definition.*—Definition: "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received.

3. *Licence for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in Nigeria except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus Aboard Ships to be Worked in Accordance with Regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of Nigeria, otherwise than in accordance with regulations made under this Ordinance.

5. *Regulations.*—(1) The Governor may make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over

the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of Nigeria shall be subject to such further Regulations as may be made by the Governor and such Regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf, or contrary to the provisions of any Regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by a superior officer and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy thereon.

7. *Penalties and Procedure.*—Any person who shall offend against any provision of this Ordinance or any of the Regulations made thereunder shall be liable to a fine of fifty pounds, and the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Saving Section as Regards Electrical Apparatus.*—Nothing in this Ordinance shall prevent any person from making or using

electrical apparatus for actuating machinery or for any purpose other than that of wireless telegraphy.

9. *Repeal No. 12 of 1913 of Southern Nigeria and Chapter 55 of the Laws of Northern Nigeria.*—The Wireless Telegraphy Ordinance, 1913, and the Wireless Telegraphy Proclamation are hereby repealed.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1916.

B The following Regulations are made by His Excellency the Governor-General under and by virtue of the provisions of section 5 of the Wireless Telegraphy Ordinance, 1916:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Nigeria shall be worked in such a way as not to interfere with:—

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in Nigeria or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay or waters of Nigeria except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed, with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by His Excellency the Governor this 10th day of November, 1916.

NORWAY

(See Maps 2, 9, and 15.)

NORWAY is a constitutional monarchy, the reigning sovereign being King Haakon VII, who was elected by the Storting in November, 1905, after the peaceful revolution which restored to the Norwegians their complete independence.

CONTROL.

Radiotelegraphy is organised under the supervision of the Telegraph Department; whilst for naval and military purposes the War Office and Admiralty exercise jurisdiction over their own wireless section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Capt. Niels Stockfleth Schultz Nickelsen	Director-General of Posts and Telegraphs ..	Christiania
Mr. Hermod Peterson	Radio Engineer and Chief of Wireless Department	Christiania (Telegraph Department)
Comdr. J. Bull ..	Director of Mining Department of the Navy	Horten (Navy Yard)
Comdr. F. Bugge ..	Inspector Wireless Department of the Navy	Horten (Navy Yard)

ORGANISATION.

The first wireless stations to be erected and opened for public correspondence were those of Sörvaagen and Röst, both completed in 1906. Radiotelegraphic communication was established in 1911 between Norway and Spitzbergen, and has been maintained ever since.

Some improvements have been made in the existing land stations, the Bergen radio having been equipped with a 5 kW. valve transmitter for telegraphy and telephony. The Government intend modernising the Stavanger Transatlantic Station, the transmitter as well as the receiver, but nothing has as yet been decided upon. Two $\frac{1}{4}$ kW. automatic radio beacons have been erected, one on the Færder Lighthouse at the entrance of the

Kristianiafjord, and the other on the Marstenen Lighthouse on the west coast of Norway, near Bergen.

The latest available statistics enumerate :—

Stations for public service to ships	7
Stations for Government traffic only	1
Stations for public service	3
Stations for public service radio telephony	2
Stations for Transatlantic public traffic	1
Stations under construction	3
Installation on Norwegian merchant vessels	about 500

Two Norwegian companies have been formed under the titles of " Norsk Marconi Kompani A/S " at Christiania, and A/S Det Norske Radioselskap. The former company is working in conjunction with Marconi's Wireless Telegraph Co., Ltd., London, and has the sole rights of the Marconi patents for Norway. The latter is working in conjunction with the Telefunken Company.

Meteorological, Storm Warnings and Fisheries Services are largely in use.

There has recently been formed a wireless club called Norsk Radio Klub.

ADMINISTRATION.

The Laws and Regulations under which wireless is administered in this country appear in the following pages in accordance with the list appended hereto :—

The general laws and regulations with regard to the control and use of wireless stations are still unchanged, and the question of amateur licences and experimental working for private individuals is not yet solved. There is, however, reason to believe that everything is being done to facilitate matters, particularly in view of the broadcasting problem which is also arising in this country.

A—Law of July 24th, 1914.

B—Law of August 18th, 1914.

C—Regulations.

D—Ship Licence.

E—Certificate for Wireless Telegraphists.

F—Agreement between Telegraph Administration of Norway, Denmark and Sweden regarding expeditious forwarding of radiotelegrams.

LAW OF JULY, 1914.

A *Law of July 24th, 1914, supplementing and amending the Law of April 29th, 1899, relating to the forwarding of communications by aid of telegraphic conductors or such like installations and relating to the repeal of Law No. 2 of July 16th, 1907 :—*

Section 1.—On ships which sail under the Norwegian flag and which do not belong to the Norwegian family, stations or installations for telegraphing or telephoning by wireless both within and without the boundaries of the Kingdom may only be installed and worked after an authorisation obtained in advance, which will be granted by the King, or whoever may be authorised thereto, on certain definite conditions for a stipulated period of time. The permission may at any time be withdrawn if the conditions imposed are not adhered to.

Detailed Rules and Regulations relating to the fitting up and working of such stations or installations shall be drawn up by the King.

On ships which sail under a foreign flag and are within Norwegian territorial waters wireless telegraphing and telephoning can only be carried on—even if they have permission

for same from the authorities of the foreign country—subject to observance of the provisions which are made with respect thereto by the King or whomsoever he may have authorised for the purpose, who may, moreover, forbid all telegraphing or telephoning from such ships, whenever circumstances may be considered to require it.

The King may determine that import and sale in the country or letting of apparatus or parts of apparatus for transmission or reception by radiotelegraphy or radiotelephony shall be depending on special permission, which will be given by the King or whomsoever he may authorise hereto.

Further directions as to the conditions whereupon such permissions are granted shall be drawn up by the King.

Doubts as to what is meant by " parts of apparatus " after this law are decided upon by the King or whomsoever he may authorise hereto.

Section 2.—The exceptions mentioned in the Law of April 29th, 1899, under Section 1, 2nd paragraph, relating to the working of plant which may be used by a commune or

private person for his own use, or such as railways may install for their own working, shall not apply so far as the working of installations for wireless telegraphy or telephony are concerned.

Section 3.—Any infractions of the aforementioned conditions shall be punished pursuant to the provisions laid down in the Law of April 29th, 1899, Section 6.

Moreover, any transgression of the rules or provisions which are drawn up with regard to Section 1 of the present Law shall be punished by fines.

Section 4.—This Law shall come into force immediately. The Law of July 16th, 1907, containing additions and amendments to the Law of April 29th, 1899, relating to the forwarding of communications by means of telegraph lines or similar installations, is hereby repealed.

LAW OF AUGUST, 1914.

B The following paragraph, taken from the "Law of August 18th, 1914," amending the Law of April 29th, 1899, relates directly to Wireless Telegraphy:—

Within the boundaries of Norway, or its territorial waters, stations and installations for wireless telegraphy and telephony may only be erected or worked after permission has been obtained from the King or whomsoever he may authorise thereto, and on such conditions as are laid down in the said permission.

REGULATIONS.

C The following regulations are based on the Law of July 24th, 1901:—

1. Within the limits of Norwegian territorial waters radiotelegraphic or radiotelephonic stations on board foreign ships must not be used without special licence, unless it concerns:—

(1) Correspondence regarding ships in distress or in order to prevent accidents.

(2) Correspondence with the nearest Norwegian coast station.

(3) Correspondence with other ship stations provided each of the ships are at least 10 nautical miles from the nearest Norwegian coast station.

In the cases (2) and (3) the correspondence shall at once be suspended if it is required by the Telegraph Department, the Marine Department, or by any one of the radio stations under their authority.

2. In Norwegian ports, where official radio stations are established, and within territories which at any time may be determined by Norwegian authorities, and about which information may be obtained at the nearest official coast station, the ship station must not be used for other correspondence than mentioned in para. 1 (1), unless special permission is obtained.

3. Requests for permission to use the radio stations within the Norwegian territorial waters for other correspondence than mentioned above must be sent to the Telegraph Department, which takes its decision after conference with the Marine Department.

4. However, the preceding provisions do not, with the following exceptions, apply to stations on board foreign ships of war. Provided the ships enter Norwegian ports, where official radio stations are established (see the list published by the Telegraph Department), and wish to make use of the radio apparatus on board, they shall first apply to the manager of the official radio station at the place, which will inform it what times it is permitted to use the apparatus.

In this application, which can be made by radio, the wavelength which it is wished to use shall be stated.

In Norwegian ports and territorial waters such vessels may otherwise freely use their radio stations. The correspondence must, however, at once be suspended, when it is required by the Telegraph Department, the Marine Department, or by any one of the stations under their authority.

5. Whenever the radio station is used during the stay of the ship in Norwegian waters, this shall be done subject to the regulations contained in the International Telegraph Convention, with the rules pertaining thereto.

6. The above-mentioned regulations are only applicable when Norway is not at war, and only to the ships of non-belligerent foreign forces.

7. The preceding regulations come into force from September 1st, 1922. From the same date the previous regulations approved by the Royal Decree of October 23th, 1908, are repealed.

NORWEGIAN LICENCE CONDITIONS.

D Conditions for erection and working of Radiotelegraph and Radiotelephone stations on board ships (ship stations).

FORM OF LICENCE.

According to the Law of 24th July, 1914, and the Royal Decree of the 30th August, 1913, permission is hereby given to.....

..... to erect and work on board the ship..... a Radiotelegraph Station (Radiotelephone Station) in accordance with the Table of Particulars on the last page of this form. The permission is valid from..... to..... and is given on the following conditions.

1. The station shall belong to the..... class of stations as specified in the International Radiotelegraph Convention Service Regulations, Art. XIII b, and will thus have..... service.

2. The installation shall be effected in every respect in accordance with the installation plan approved by the Telegraph Department, and must not be departed from without the agreement of the said department. Ships belonging to the 1st and 2nd classes must be provided with emergency Radiotelegraph installations, as laid down in the existing Radiotelegraphic Service Regulations.

3. The holder of the licence shall, as far as the erection and working of the station is concerned, be under the obligation in every respect to adhere to existing international agreements with annexed regulations concerning Radiotelegraph and Telephony when such International agreements have been adhered to by Norway, and further he shall abide by such regulations as may be issued by the Department for Public Works or by the Telegraph Department.

4. The Telegraph Department shall have the right, in the interests of the service and (after conferring with the Naval Department) to require any alterations to be made in the wavelengths employed as given in the above-mentioned Table of Particulars within the limits laid down in the regulations either as a temporary or permanent measure in the working of the station.

5. The holder of the licence shall recognise the importance of keeping the station in the best possible conditions in order to ensure good working.

6. The station shall be under the obligation to forward telegrams to and from persons on board, with due regard to existing general rules for such work. Further, the station shall be obliged to communicate with other ship or coast stations without regard to the system of apparatus employed at those stations.

7. The answering of signals from ships in distress and the correspondence caused thereby shall have priority over all other correspondence.

8. During the ship's stay in a Norwegian Port the station must not be used for communication either with Norwegian or with Foreign coast stations. Neither shall the station, while the ship is in a Norwegian port, be used for communication with other ship stations without special permission, or unless such communication is effected with a view to prevent accidents. Special permission is granted by the Telegraph Department after conferring with the Naval Department.

9. The call signal of the station is.....

10. The tax due to the ship station is.....
.....(ore (..... centimes) per
word with a minimum of.....(ore)
(.....centimes) per message.

11. The service on board must be performed by one telegraphist, or, for ship stations of class I, by two or more telegraphists holding a certificate issued by the Telegraph Department.

This certificate states that the telegraphist concerned possesses the knowledge and abilities as prescribed in the existing International Regulations.

The granting of such certificate depends upon the passing of an examination arranged by the Telegraph Department. Petty Officers and Seamen belonging to the Navy's staff of mechanics, and who are specially trained as Radiotelegraphists for the Navy, are entitled to such certificate when they can prove to the Telegraph Department that they have the necessary knowledge of the handling of telegrams and when they procure from the authority concerned in the Navy, a testimonial to the effect that they satisfy the International Regulations as far as their knowledge of the instruments, ability, etc., is concerned. Without the permission of the Telegraph Department other than Norwegian subjects must not be employed for the service on board.

The holder of the licence must take the best possible care that the contents of messages do not come to the knowledge of unauthorised persons.

The telegraphist must make the usual promise of secrecy.

12. The holder of the licence is responsible for the charges that are due for the transmission of the messages sent from the ship station, including the charge for the coast station.

The Telegraph Administration, on its side, pays to the holder of the licence the charges that are due to the ship station for the messages addressed to the ship. "Journals" (abstract) should be kept in respect of the correspondence (traffic). These "Journals," together with the originals of the transmitted messages and such other documents as may be required, are to be sent to the Telegraph Department, as far as possible, at the end of each month.

The mutual settlement of the charges will take place quarterly or monthly, as may be arranged between the Telegraph Department and the holder of the licence. However, with the agreement of the Telegraph Department

the holder of the licence may make other arrangements for the accounting of stations on ships that are exclusively engaged in foreign waters. Such arrangements may be made with the Administrations owning the coast stations that the ships usually make use of. Similarly, the Telegraph Department may make arrangements other than those mentioned above with Foreign Administrations.

13. The station is subject to such supervision as may be decided by the Department for Public Works, and one or more of the Officials appointed by the Department for Public Works or by the Telegraph Department should be given opportunity to inspect the station.

For the supervision of the station the holder of the licence has to pay a certain fee that will be decided by the Department.

14. When State or other public reasons so demand it, the Department for Public Works or the Naval Department may partly or entirely prohibit the transmission of any kind of traffic correspondence at the station without admitting any claim for compensation. Likewise, in the interests of the service, the Telegraph or Naval Department can prohibit with the same effect all correspondence from the station, either at certain places or at certain times of the day.

15. The Norwegian State has the right to take over the station with six months' notice against compensation, the amount of which will be fixed after valuation, should it not be possible to arrive at an amicable adjustment.

The valuation will be made by a Committee of three members, whereof one member is nominated by the owner, one by the Telegraph Department and one by the Department for Public Works.

The member nominated by the Department for Public Works will be the Chairman of the Committee.

The questions put before the Committee will be decided solely by a majority of votes.

In case the owner has not, within thirty days after the reception of the invitation, made any such nomination as mentioned above, or in case the member nominated by him fails to attend, the valuation will then with obligatory effect be decided by the other nominees.

In case of equal voting the vote of the Chairman shall decide the matter.

In the valuation regard shall only be paid to the technical value of the station at the moment of valuation, the income, etc., derived from the station not being taken into account.

The valuation shall take place within a time-limit fixed by the Telegraph Department and will be at the public expense.

16. The licence shall become null and void in case:—

(a) Use is not made of it within a year of its issue.

(b) Breach is made of any of its regulations.

(c) The ship ceases to fly the Norwegian flag.

17. Disputes as to the intent and meaning of this licence shall, with obligatory effect, be decided by the King.

The Telegraph Department,
Christiana.....19

SCHEDULE.

System	Type of Instal-lation.	Normal range (by day).	Wave-lengths (the normal wave to be under-lined).	Description of Power Supply.	Description of Trans-mitting and Receiving Instruments. (Detailed sketch of con-nections attached.)	Type of Aerial (Sketch with measure-ments attached).	Description of Emer-gency Gear for ship stations of 1st and 2nd classes. (Detailed sketch of connections attached.)	Re-marks

CERTIFICATE.

E It is hereby testified that.....
has in a satisfactory manner pass:d the test for radiotelegraphists, ordered by the Telegraph Administration, comprising :—
 (a) Management of apparatus, and know-ledge of their action.
 (b) Transmitting and receiving by the ear with the speed ordered for a certificate of.....Class.
 (c) Regulations.
 With reference to above, and as..... has made the promise of secrecy fixed for tele-graph officials, there is hereby given to..... a certificate of.....Class, as radiotelegraphist on board ships.
 The Telegraph Administration, Kristiania, the.....

AGREEMENT

REGARDING CERTAIN EXCEPTIONS TO THE PRO-VISONS OF ARTICLE XXXV OF THE SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPH CONVENTION.
F With a view to securing a more expeditious forwarding of radiotele-grams from a ship to its homeland, the following Agreement has been concluded between the Royal Norwegian, the Royal Danish, and the Royal Swedish Telegraph Administrations, subject to the necessary sanctions :—
 Notwithstanding what is stipulated in Article XXXV para. 1 of the service regulations annexed to the International Radiotelegraph Convention, according to which a ship station

shall as a rule send its radiotelegrams to the nearest coast station, radiotelegraph stations on board ship flying the Norwegian, Danish or Swedish flag are entitled to send to the nearest coast station of the ship's homeland such radio telegrams as are addressed to that country subject to the following conditions :—
 1. That the ship is at least 25 nautical miles from any other coast station open for general correspondence.
 2. That the ship's distance from the coast station concerned is not greater than the distance from any other coast station situated in a country other than Norway, Denmark or Sweden and open for general correspondence.
 3. That transmissions cease immediately at the request of a nearer coast station whose correspondence is being disturbed by such transmissions, and
 4. That the provisions of the International Radiotelegraph Convention and the annexed Service Regulations be maintained in other respects.
 This Agreement which is executed in three copies and in each of three countries' languages comes into force on the 1st January, 1921, and shall remain in force indefinitely and until three months from the day on which it shall have been determined by one of the contracting parties.
 Christiania, the.....December, 1920.
 The Royal Norwegian Telegraph Administration.
 Copenhagen, the.....December, 1920.
 The Royal Danish Telegraph Administration.
 The Stockholm, the.....December, 1920.
 Royal Swedish Telegraph Administration.

NYASALAND PROTECTORATE.

(See Maps 25 and 31)

THIS Colony is administered (under the Colonial Office) by the Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

ADMINISTRATION.

Wireless telegraphy is not at present in operation, although provision has been made in the Statute Book for its regulation if ever it be introduced, as follows :—

WIRELESS ORDINANCE, 1908.

1. This Ordinance may be cited as " The Wireless Telegraph Ordinance, 1908."
 2. No person shall establish or use any apparatus or installation for the purpose of operating wireless telegraphs without a licence from the Governor.

Any person contravening this section shall be liable on conviction to a fine not exceeding £100 or to imprisonment with or without hard labour for a term not exceeding twelve months with or without the option of a fine, and in addition any apparatus or installations in respect of which an offence under this section is

committed may be forfeited and sold or disposed of as the Governor may direct.

3. The Governor in Council may from time to time make, and when made shall publish in the *Gazette*, rules prescribing the terms and conditions upon which licences to establish or use apparatus or installations for the purpose of operating wireless telegraphs may be granted,

and may impose a penalty on conviction for breach of any rules so made of a fine not exceeding £50 or imprisonment with or without hard labour for a term not exceeding six months with or without the option of a fine, and such rules may further provide for forfeiture and sale or disposal as the Governor may direct of any such apparatus or installations as aforesaid.

PACIFIC ISLANDS

(See Map 56.)

Including :

BRITISH—Tonga (Friendly Islands), Ducie Islands, Gilbert and Ellice Islands Colony, British Solomon Islands, Starbuck Islands, Malden Island, Baker Islands, Palmyra.

JAPANESE—The Marianne (Ladrone) Islands, The Caroline Islands, Marshall Islands.

TONGA ISLANDS (Friendly Islands)

THE Tonga Islands are under the protectorate of Great Britain, as proclaimed on May 19th, 1900. The present Sovereign is Queen Salote, who is assisted by a Legislative Assembly.

CONTROL.

A department of Telegraphs and Telephones was inaugurated at the time of the erection of the wireless station, under whose jurisdiction fall all matters concerning radiotelegraphy and telephony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. J. R. Land	Officer in Charge of Telegraphs and Telephones	Nukualofa

The station of Nukualofa is owned and controlled by the Tongan Government and handles commercial traffic.

ORGANISATION.

Nukualofa Radio (the only station yet erected in the Friendly Islands) was opened for commercial traffic on December 30th, 1919. The station works with Suva (Fiji), Apia (Samoa) and ships. It was equipped by the Amalgamated Wireless (Australasia), Ltd.

No form of licence is issued, there being at present no amateurs or experimenters in the Kingdom.

There are no time, press, aviation or direction finding services.

No regular system of broadcasting meteorological reports is in vogue, but when conditions demand it, weather reports are sent out for the information of all stations. All meteorological telegrams are handled free of charge.

ADMINISTRATION.

As regards the European population, Tonga comes under King's Regulation No. IX of 1912. (See Gilbert and Ellice Colony.) The use of wireless stations on merchant ships is controlled by the "Wireless Telegraphy Rules, 1917," made under the above-mentioned King's Regulation. An Ordinance is in effect regulating the use of wireless by Tongan natives.

A—An Ordinance to govern the use of wireless telegraphy in the Kingdom of Tonga. (No. 5 of 1918.)

AN ORDINANCE

TO GOVERN THE USE OF WIRELESS TELEGRAPHY IN THE KINGDOM OF TONGA. (No. 5 of 1918.)

A Be it enacted by the King by the advice and with the consent of the Privy Council as follows:—

1. The short title of this Ordinance shall be The Wireless Telegraphy Ordinance, 1918.

2. It shall not be lawful for any Tongan to establish maintain or use in the Kingdom of Tonga any apparatus or instrument for the purpose of electrical communication by means of wireless telegraphy without having previously obtained from the Privy Council a licence in that behalf to be granted on such terms and conditions as may be prescribed by any rules made under this Ordinance and on such other terms and conditions as the Privy Council may from time to time think fit to prescribe.

3. It shall be lawful for His Majesty the King in Council from time to time to make rules:—

(a) Prescribing the manner in which licences under this Ordinance are to be

applied for and granted and the fees payable on the grant of such licence.

(b) Generally for the purpose of carrying this Ordinance into effect.

4. Any person who contravenes the provisions of this Ordinance or of any rules made hereunder or fails to observe or perform the terms or conditions of a licence granted hereunder or prescribed by any rules aforesaid shall be liable on conviction to a fine not exceeding fifty pounds or in default of payment to imprisonment for any term not exceeding six months and the apparatus or instrument in respect of which such conviction was obtained may by order of the magistrate before whom such conviction was obtained be forfeited.

5. All proceedings under this Ordinance may be taken before a Police Magistrate and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on conviction before a Police Magistrate.

March 5th, 1918.

GILBERT AND ELLICE ISLANDS COLONY

BY the "Gilbert and Ellice Order in Council, 1915," these Islands, together with all small islands, islets, rocks and reefs, depending on them, were annexed to and form part of His Majesty's Dominions, and are known as the "Gilbert and Ellice Islands Colony." The Administration of the Group is vested in a Resident Commissioner, who is responsible to the High Commissioner for the Western Pacific, with headquarters on Ocean Island.

CONTROL AND ORGANISATION.

Radiotelegraphy is a Government monopoly, though licences may be granted for private erection and working. There are three wireless stations in the group, viz.: Ocean Island, Fanning, and Washington Islands. The two latter stations, which are privately owned by the Fanning and Washington Islands Trading Company, and licensed by this Colony, are not at present in operation.

Ocean Island is the only Government land station, being operated and controlled by the Government of the Colony. It comprises a Marconi standard 5 kW. set and modern amplifying valve receivers.

Both day and night communication was established with Suva, Fiji, in January, 1920, and an efficient service has been maintained since. In addition this station works with Tulagi and Nauru. 1,650 metre wave is used with all land stations, and 600 metres for ship working.

The British Phosphate Commission contemplate the erection of a station for communication with Nauru. It is also proposed to equip the Government vessel, H.M.C.S. "Ranadi" with a wireless installation.

There are no existing or projected stations designed for aviation or meteorological purposes and no time or weather programme is in force at any of the existing stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. G. L. G. Tilford ..	Officer in Charge	Ocean Island

ADMINISTRATION.

The following are the rules and regulations at present in force:—

A—King's Regulation No. IX of 1912.

B—Rules under the provisions thereof.

**KING'S REGULATION No. IX OF 1912:
TO GOVERN THE USE OF WIRELESS TELEGRAPHY
IN THE WESTERN PACIFIC.**

A 1. This Regulation may be cited as "The Wireless Telegraphy Regulation, 1912."

2. The Wireless Telegraphy Regulation, 1907, is hereby repealed.

3. (1) It shall not be lawful for any person to establish, install or use any apparatus for the purpose of electrical communication by means of wireless telegraphy in any protectorates, islands, or places within the jurisdiction of the High Commissioner for the Western Pacific specified in the schedule hereto without a licence to do so first obtained from the said High Commissioner.

(2) A licence under this section shall be subject to such terms and conditions as may be prescribed by any rules made under this regulation and to such other terms and conditions as the High Commissioner may from time to time prescribe.

4. The High Commissioner may make rules from time to time to carry out the provisions of this regulation and in particular to regulate the use of apparatus for wireless telegraphy on board merchant ships, whether British or foreign vessels, while in the territorial waters of the protectorates or islands or places aforesaid.

5. Any person who contravenes the provisions of this Regulation or of any rules made hereunder, or fails to observe and perform the terms and conditions of a licence granted by the High Commissioner hereunder or prescribed by any rules aforesaid, shall be liable to a penalty not exceeding one hundred pounds and to the forfeiture of any apparatus established, installed or used for the purpose aforementioned.

6. This Regulation shall not apply to the islands of the Pacific Ocean known as the New Hebrides, including the Banks Islands and Torres Islands.

SCHEDULE.

The British Solomon Islands Protectorate, The Gilbert and Ellice Islands Protectorate, The Union (Tokelau) Islands, The Phoenix Islands, Fanning Island, Washington Island, Christmas Island and all other islands in the Western Pacific not being within the jurisdiction of the Commonwealth of Australia or any of the states thereof or of the Dominion of New Zealand or of any civilised Power.

B **RULES TO REGULATE THE USE OF
WIRELESS TELEGRAPH APPARATUS ON
MERCHANT SHIPS IN THE WESTERN
PACIFIC, MADE BY THE HIGH COMMISSIONER
UNDER THE PROVISIONS OF THE WIRELESS
TELEGRAPHY REGULATION, 1912.**

1. These rules may be cited as the Wireless Telegraphy Rules, 1917.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters

of the protectorates, islands and places specified in the Schedule to the Wireless Telegraphy Regulation, 1912, shall be worked in such a way as not to interfere with—

(a) Navalsignalling; and

(b) The working of any wireless telegraph station, lawfully established, installed or worked in those protectorates, islands or places or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. (a) The apparatus for wireless telegraphy on board a merchant ship shall not be worked whilst such ship is within a harbour in any colony, protectorate or island specified in the Schedule to the Wireless Telegraphy Regulation, 1912.

(b) For the proper enforcement of the above every ship of British register in any such harbour shall completely disconnect its aerial wires from its radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

(c) Every ship of foreign register in any such harbour shall, subject to the provisions of the following subsection (d) take down its aerial wires completely and disconnect the same from its radiotelegraph apparatus.

(d) A ship of foreign register remaining in any such harbour for less than twelve hours, may, at the discretion of the Resident Commissioner or other Government officer in charge of the colony, protectorate or island to which such harbour belongs, be permitted to leave its aerials up, provided the same are disconnected in accordance with the provisions of subsection (b) of this rule.

4. If at any time, in the opinion of the High Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters aforesaid shall be subject to such further rules as may be made by the High Commissioner from time to time, and those rules may prohibit or regulate that use in all cases or in such cases as may be deemed desirable.

5. It shall be the duty of the master of a ship to see that the requirements of these rules are carried out.

6. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. The rules made on December 16th, 1912, are hereby repealed.

Dated this twenty-ninth day of August, 1917.

MARIANNE, (LADRONE), CAROLINE, MARSHALL ISLANDS

BY the Treaty of Versailles, Japan obtained mandatory of the former German possessions north of the equator, their population being largely Japanese.

The station at Guam, Marianne Islands (See Map 22), is owned and operated by the U.S. Navy.

PANAMA

(See Maps 47, 48 and 50.)

Including : Panama Republic, Panama Canal Zone.

PANAMA, formerly a department of the Republic of Colombia, asserted its independence on November 3rd, 1903.

When the United States Government took over the construction of the canal a treaty between the United States and Panama of November 18th, 1903, granted to the United States in perpetuity a strip of land 10 miles in width, extending across the Isthmus a distance of 50 miles. The rights of sovereignty are vested in the U.S.A. under a Treaty signed on February 26th, 1904.

The zone is ruled by a Governor, who reports through the Secretary of War to the President and conducts the government according to the authority invested in him by Acts of Congress and Executive orders. In periods of crisis or times of war the supreme command is vested in the Commanding Officer of the Troops, designated as the Panama Canal Department of the U.S.A. Army. The American Canal was opened for traffic on August 15th, 1914.

CONTROL.

Radiotelegraphy in the zone is administered by the Navy Department of the United States. All wireless stations on the Isthmus are under control of the Commandant, 15th Naval District, Balboa Heights, Canal Zone, and under the immediate supervision of the Communication Superintendent, 15th Naval District.

Under agreement between the Republic of Panama and the United States of America Radiotelegraphic Communication within the Republic, as well as in the Canal Zone, remains under the control of the U.S.A. This arrangement rests on Decree No. 130 of August 29th, 1914, signed by the President of the Panama Republic.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Capt. L. R. Sargent, U.S.N.	Marine Superintendent Panama Canal and Commandant 15th U.S. Naval District	Balboa Heights
Lt.-Com. F. L. Riefkohl	Communication Superintendent 15th U.S. Naval District	Balboa Radio Sta- tion Fort Amador

ORGANISATION.

The Colon station, established on March 1st, 1910, was re-equipped with improved apparatus, and opened to commercial traffic in January, 1913. At Balboa (Pacific end of the Canal) there stands a station opened for commercial business in June, 1913, and replaced by an improved installation on the same site in 1914.

The Almirante Radio belonging to the United Fruit Co., was established in 1921.

There are no wireless clubs or radio societies, the whole of the wireless operations being controlled and administered by the U.S. Navy.

An unofficial news service for the benefit of persons at sea is carried on by the Colon station, which each day at 4.55 p.m. radiates broadcast about 200 words of news made up of extracts from the Panama morning papers, whilst Press despatches obtained by radio from the United States are re-broadcast at 5 a.m. by Balboa (NBA) on 10,110 metres (arc).

ADMINISTRATION.

We publish below the text of the various Acts and Decrees affecting radiotelegraphy in the Canal Zone and of a circular relating to radio practice :

The following is a copy of Circular No. 626-10, issued by the Executive Office, The Panama Canal, February 17th 1922:

"Hereafter ships with clean bills of health, from non-infected ports, and without sickness on board, intending to transit the canal without taking supplies or stores of any kind or landing passengers or cargo, may be granted practice by radio under the following conditions:—

(a) By making application therefor by radio between the hours of 8 a.m. and 4 p.m. Such application to state—

(1) That the vessel has a clean bill of health and has no sickness on board.

(2) Names of ports and places visited within the past ten days.

(3) That the vessel intends to transit the canal without taking stores of any kind or landing passengers or cargo.

(b) Radio will be addressed to Chief Quarantine Office, through port captain.

(c) Practice will not be considered as granted until reply has been received from port captain, 'Chief Quarantine Officer grants practice.'"

A—Act to regulate Radio Communication issued August 13th, 1912.

B—Section 6 of Act to Provide for Opening, Maintenance, Protection and Operation of the Panama Canal (dated August 24th, 1912).

C—Extracts from Rules and Regulations for the Operation and Navigation of the Panama Canal, dated August 15th, 1919.

D—Notice concerning Commercial Service at Naval Stations, dated September 1st, 1913.

E—Circular *re* Compulsory Wireless, dated July 23rd, 1914.

F—Circular *re* Free Radio Service, dated November 17th, 1914.

AN ACT TO REGULATE RADIO COMMUNICATION.

A Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company, or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a licence, revocable for cause, in that behalf granted by the Secretary of Commerce and Labour upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: Provided, that the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a licence shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce and Labour. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

SEC. 2.—That every such licence shall be in such form as the Secretary of Commerce and Labour shall determine and shall contain

the restrictions, pursuant to this Act, on and subject to which the licence is granted; that every such licence shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licenced for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such licence shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such licence shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as aforesaid be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce and Labour. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said licence for a period

to be fixed by the Secretary of Commerce and Labour not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court, for each and every such offence: Provided, that in case of emergency the Secretary of Commerce and Labour may authorise a collector of customs to issue a temporary permit, in lieu of a licence, to the operator on a vessel subject to the radio ship Act of June twenty-fourth, nineteen hundred and ten.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce and Labour through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce and Labour may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above-mentioned can ensue.

The Secretary of Commerce and Labour may grant special temporary licences to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

1. *Normal Wavelength.*—Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every control station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the international convention in force; Provided that the Secretary of Commerce and Labour may, in his discretion, change the limit of wavelength reservation made by Regulations 1 and 2 to accord with any international agreement to which the United States is a party.

2. *Other Wavelengths.*—In addition to the normal sending wavelength all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: Provided, that they do not exceed 600 metres or that they do exceed 1,600 metres: Provided further, that the character of the wave emitted conforms to the requirements of Regulations 3 and 4 following.

3. *Use of a "Pure Wave."*—At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemeter, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

4. *Use of a "Sharp Wave."*—At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

5. *Use of "Standard Distress Wave."*—Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force except on vessels of small tonnage unable to have plants insuring that wavelength.

6. *Signal of Distress.*—The distress call used shall be the international signal of distress:—

• • • — — — • • •

7. *Use of "Broad Interfering Wave" for Distress Signals.*—When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

8. *Distance Requirement for Distress Signals.*—Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in Regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

9. *"Right of Way" for Distress Signals.*—All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

10. *Reduced Power for Ships near a Government Station.*—No station on shipboard, when within fifteen nautical miles of a naval or military station, shall use a transformer input exceeding one kilowatt, nor, when within five nautical miles of such a station, a transformer input exceeding one-half kilowatt, except for sending signals of distress or signals or radiograms relating thereto.

11. *Intercommunication.*—Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station respectively.

It shall be the duty of each such shore station during the hours it is in operation, to listen in at intervals of not less than fifteen minutes and for a period of not less than two minutes with the receiver tuned to receive messages of 300 metre wavelengths.

12. *Division of Time.*—At important seaports and all other places where naval or military and private or commercial shore

stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and the character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce and Labour may, on the recommendation of the Department concerned, designate the station or stations which may be required to observe this division of time.

13. Government Stations to Observe Division of Time.—The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

14. Use of Unnecessary Power.—In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

15. General Restrictions on Private Stations.—No private or commercial stations not engaged in the transaction of *bona fide* commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres, or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labour contained in the licence of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of \$100 or \$25, respectively provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

16. Special Restrictions in the Vicinities of Government Stations.—No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding one-half kilowatt.

17. Ship Stations to Communicate with Nearest Shore Station.—In general, the ship-board stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

18. Limitations for Future Installations in Vicinities of Government Stations.—No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical

miles of the following naval or military stations—to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin convention of 1906 and future international conventions or treaties to which the United States may be a party, at each of the stations above referred to and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin convention of 1906 and future international conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

19. Secrecy of Messages.—No person or persons engaged in or having knowledge of the operation of any station or stations shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed, or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punishable by a fine of not more than \$250 or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the Court.

Penalties.—For violation of any of these regulations, subject to which a licence under sections 1 and 2 of this Act may be issued the, owners of the apparatus shall be liable to a penalty of \$100, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any of such regulations the licence may be revoked.

For violation of any of these regulations, except as provided in Regulations 19, subject to which a licence under section 3 of this Act may be issued, the operation shall be subject to a penalty of \$25, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any such regulations, the licence shall be suspended or revoked.

Sec. 5.—That every licence granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon conviction thereof the owner or operator, or both

shall be punishable by a fine of not to exceed \$500 or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than \$2,500 or imprisonment for not more than five years, or both, in the discretion of the court, for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than \$1,000 or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

SEC. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this act shall apply to apparatus for radio communication on any foreign ship.

SEC. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

SEC. 10.—That this Act shall not apply to the Philippine Islands.

SEC. 11.—That this Act shall take effect and be in force on and after four months from its passage.

Approved, August 13th, 1912.

EXTRACT FROM ACT. (Dated August 24th, 1912.)

TO PROVIDE FOR OPENING, MAINTENANCE, PROTECTION AND OPERATION OF THE PANAMA CANAL.

B SEC. 6.—That the President is authorised to cause to be erected, maintained, and operated, subject to the International Convention and the Act of Congress to regulate radio communication, at suitable places along the Panama Canal and the coast adjacent to its two terminals, in connection with the operation of the said Canal, such wireless telegraphic installations as he may deem necessary for the operation, maintenance, sanitation, and protection of said Canal, and for other purposes. If it is found necessary to locate such installations upon territory of the Republic of Panama, the President is authorised to make such agreement with said Government as may be necessary, and also to provide for the acceptance and transmission by said system, of all private and commercial messages, and those of the Government of Panama, on such terms and for such tolls as

the President may prescribe: *Provided*, That the messages of the Government of the United States and the departments thereof, and the management of the Panama Canal, shall always be given precedence over all other messages. The President is also authorised, in his discretion, to enter into such operating agreements or leases with any private wireless company or companies as may best insure freedom from interference with the wireless telegraphic installations established by the United States.

EXTRACT FROM RULES AND REGULATIONS.

(Dated August 15th, 1919.)

C 40. *Radio Communication.* — As soon as radio communication can be established with the Canal, vessels should report their names, nationality, length, draft, tonnage, whether or not they desire to pass through the Canal, require coal, provisions, supplies, repairs, to go alongside of a wharf, the use of tugs, probable time of arrival, length of stay in port, or any other matters of importance or interest. If this information has been previously communicated through agents or otherwise to the captain of the port, it will not be necessary to report by radio; but the probable time of arrival should always be sent.

41. Control of radio communication is entirely in the hands of the radio shore stations. No vessel will be allowed to interfere in the slightest degree with the Canal radio stations; upon an order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio, even if in the midst of transmission of a message, she shall immediately comply.

42. Upon a ship's arriving within the 15-mile limit, and until leaving the 15-mile limit of the Canal Zone, she shall transmit only with low power, not exceeding one-half kilowatt.

43. Messages to stations will be sent only to Colon station (NAX) when in Gatun Locks and to northward thereof, and only to Balboa station (NBA) when in Miraflores Locks and to southward thereof; between these two points ships may work to either station, preferably to the nearer one; the high-power station (Darien) at Radio will not handle commercial work and will not be called for Canal business except in case of emergency.

44. All messages between ships in the Canal Zone and ships at sea must be forwarded through the nearer shore station.

45. Messages from ships in the Caribbean Sea for ships in the Pacific waters, or *vice versa*, shall be routed through the Canal Zone shore stations.

46. All vessels fitted with radio, after leaving the terminal harbour to pass through the Canal, shall keep an operator on watch until the further terminal harbour has been reached; this applies to the time when they are anchored in Gatun Lake, while passing through the locks, or moored to the lock walls, or to any of the wharves in the Canal proper, as well as when they are under way. Messages relating to the ship's movements and the Canal business shall take precedence over all commercial messages.

47. Pilots on vessels passing through the Canal shall have the right to use a vessel's radio freely for the transaction of the Canal business.

48. Under the direction of the pilots, vessels will from time to time report their progress through the Canal; accidents to machinery, propellers, steering gear, equipment, or anything else that may delay them or require assistance; any sickness or casualties that require medical attendance from Canal officials, or any other matter of importance that may arise.

49. No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ship on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.*

50. No vessel will be allowed to communicate with any lock or signal station while in transit through the Canal, except through the pilot; all messages of any kind must be sent through him. This does not apply to vessels moored at the terminals of Cristobal or Balboa, before entering or after having passed through the Canal, which may wish to communicate through the terminal stations.

51. Vessels in transit through the Canal can communicate with the lock and signal station through the pilots, both by the international code and special signals; information on this subject may be obtained from the Governor of the Panama Canal.

118. In thick and foggy weather vessels will not be allowed to enter the Canal or leave locks or mooring station until the weather has cleared. Vessels in transit, when overtaken by thick or foggy weather, must immediately take every precaution and make preparation to anchor or moor at the first available place, and so remain until the weather clears. Vessels equipped with radio, when overtaken by thick or foggy weather, should immediately so report, in order that the proper fog signals may be made at the mooring stations on the approach of such vessels.

RADIO SERVICE.

Control of Radio.—The United States Government controls radio in the Republic of Panama and contiguous waters. The U.S. Naval Communication Service maintains three Naval Radio Stations in the Canal Zone; coastal stations at Colon and Balboa, and a high-powered station at Darien. In the Republic of Panama it maintains Naval Radio Stations at Cape Mala, La Palma, and Puerto Obaldia. The Cape Mala Radio Station, located at Cape Mala, R. P., at the south-west entrance to the Bay of Panama, is connected by telegraph with the Canal Zone and all telegraph offices in the Republic of Panama. The Radio Stations at La Palma and Puerto Obaldia are located in outlying sections of the Republic of Panama which have no telegraph connections, and are primarily for intercommunication between these districts and other sections of the Republic of Panama and the Canal Zone, through Balboa Radio. Control of radio communication is entirely in the hands of these stations. No vessels will be allowed to interfere in the slightest degree with the Canal radio stations; upon an order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio; even if in the midst of transmission of a message, she shall immediately comply.

* Canal Zone. Itemised lists not allowed.

*As Amended by Executive Order of November 4th, 1914. (See F. p. 404.)

Commercial Radiograms.—All Naval Radio stations given above, except Darien, are open to commercial traffic.

Canal Business Radiograms.—With the exception of Darien, all Naval Radio Stations given above will handle Canal business addressed to the proper officials of the Panama Canal, its departments and subsidiary companies.—No receiving or forwarding charge will be made by the Naval Radio Stations for this service. The first word in the address of such messages should be "GOVT" (Example: "GOVT. Port Captain Cristobal,") to show that they are official messages on Canal business. The shore stations reserve the right to decide whether a message is official or commercial in character.

Stations to be Called.—Ships on the Atlantic side will communicate only with Colon (NAX). Ships on the Pacific within 50 miles of Balboa will communicate only with Balboa (NBA). Ships in the Pacific when more than 50 miles from Balboa will communicate with Cape Mala (NNT), from which station messages are relayed to the Canal Zone or Republic of Panama by telegraph. Ships in the Canal, when to the Northward of Darien will work Colon (NAX), when to the Southward of Darien work Balboa (NBA).

Ships will communicate through nearest shore station. On arriving within range of a shore station ships should send a (TR) position report, furnishing data required by Article 28, Service Regulations Affixed to the International Radiotelegraph Convention, London, 1912. Due to the large amount of radio work in the vicinity of the Canal, and the necessity of reducing interference to a minimum, ships should send the required position report whether they have messages to transmit or not. This is desired in order that the calling of vessels by shore stations having messages for such ships may be reduced to a minimum. Upon receiving a position report from a ship, the shore station will know that the ship is in range and will immediately deliver any messages on file for that ship. Any ship which desires to communicate with a shore station, and has not previously submitted a (TR) report to that station, will be requested to submit such report before any messages are accepted from it.

All TR reports received are given to the Port Captain concerned and to the vessel's agents (if known).

Balboa Radio (NBA) is a distant control (Receiving) station, therefore, in case of emergency, Balboa Radio may be called and communication with it established, though Balboa may at the time be transmitting.

Hours of Service.—Colon, Balboa, and Cape Mala maintain a constant watch, day and night.

La Palma and Puerto Obaldia maintain daily schedules of watches.

EXTRACT FROM SUPPLEMENT TO RULES.

(Dated September 1st, 1913.)

COMMERCIAL SERVICE AT NAVAL RADIO STATIONS.

Beginning September 1st, 1913, the radio stations of the United States Navy at Colon and Balboa are handling special classes of commercial radiograms, heretofore prohibited, as follows:—

1. Reply paid messages (where both message and answer can be prepaid by the sender).

2. Messages calling for repetition of messages (for verification only. Charge for repeating back is one-fourth the charge for the original message).

3. Radiograms to be delivered by mail. (If received from a ship, these will be mailed from the radio station. "Ocean letters" will be mailed by the ship at the first port of call, or at any port of call designated).

4. Multiple radiograms. These are messages addressed either to several persons at same address or to some person at several addresses served by the same radio station. These messages when received from sea will be separated and sent as so many individual messages over the land wire.

5. Radiograms calling for acknowledgment of receipt. (Such acknowledgment is restricted to notification of date and hour at which the coast station delivered the radiogram to ship addressed; and may be sent by either mail or telegram).

6. Paid service notices. (Sent in order to correct address or text to cancel a message, etc.)

Both stations, Colon and Balboa, are connected by direct wire with the Panama railroad telephone system and radiograms can be filed at any local office. Attention is invited to the fact that no collect messages are handled, and no commercial messages are handled, between stations which are connected by cable or telegraph, as, for instance, to Key West or Port Lincoln.

The time of arrival of all Panama railroad boats is given to the telephone control at Colon as soon as received, and can be obtained there upon request without calling the radio station at Colon.

EXECUTIVE ORDER. WIRELESS APPARATUS ON OCEAN- GOING VESSELS.

Published in Circular No. 601-16, dated Culebra, C.Z., July 23rd, 1914.
To Require Ocean-going Vessels to be Fitted with Wireless Apparatus.

By virtue of the authority vested in me, I hereby establish the following order for the Canal Zone:—

SEC. 1.—From and after the first day of July, 1915, it shall be unlawful for any ocean-going steamer of the United States, or of any

foreign country, carrying fifty or more persons including passengers and crew, to leave or attempt to leave any port of the Canal Zone unless such steamer shall be equipped with an efficient apparatus for radio communication in good working order in charge of a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages for a distance of at least 100 miles, night or day: *Provided*, That the provisions of this order, shall not apply to steamers plying only between the Canal Zone and ports less than 200 miles therefrom.

SEC. 2.—The master or other person being in charge of such vessel which leaves or attempts to leave any port of the Canal Zone in violation, of any of the provisions of this order shall, upon conviction, be fined in a sum not to exceed Five thousand Dollars (\$5,000), and any such fine shall be a lien upon such vessel, and the vessel may be liable therefor in the District Court of the Canal Zone, and the leaving or attempting to leave by any vessel from each and every port of the Canal Zone shall constitute a separate offence.

SEC. 3.—This order shall take effect from and after this date July 9th, 1914.

EXECUTIVE ORDER.

FREE RADIO SERVICE FOR CANAL BUSINESS.
Published in Circular No. 601-33, dated Balboa Heights, C.Z., November 17th, 1914.

Amending paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under its Jurisdiction."

By virtue of the authority vested in me under the Panama Canal Act, paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under Its Jurisdiction," promulgated by Executive Order No. 1990, dated July 9th, 1914, is hereby amended to read as follows:—

49.—No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.

PARAGUAY

(See Maps 49, 51, 52 and 53.)

THE Republic of Paraguay is divided into two distinct portions by the river bearing the same name. The present constitution was proclaimed on the 25th November, 1870. The legislative authority is vested in a Congress of two houses, the executive being entrusted to a President, assisted by five ministers.

CONTROL.

There are three wireless stations in Paraguay at present open to the public, their control being vested in the Director of Posts and Telegraphs. These stations are situated at Asuncion, the capital of the Republic (or—more strictly—Lambaré, on the outskirts thereof), Concepcion, and Encarnacion. They are identical in capacity and possess a radius of 300 miles by day and 600 miles by night.

There are no privately owned stations. The Government has instituted a wireless telegraph school which is attached to the college of Ministry and Naval Cadets.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Luis A. Riart ..	Minister of Interior	Avenida Colombia, Asuncion—
(Vacant)	Director-General of Posts and Telegraphs	Calle Yegros, Esq. Bermejo, Asuncion
Juan B. Tendil ..	Head of Telegraph Office	431, Calle Oliva, Asuncion
Francisco Fernandez ..	Technical Inspector	Calle 14 de Julio, Asuncion

ORGANISATION.

The Paraguayan wireless service is at present confined to the interior of the country, for the Governments of Paraguay and Argentina have not yet been able to come to a working agreement for the maintenance of a public service. An agreement, however, has been entered into by the two Governments to use wireless as an auxiliary to relieve congestion or breakdown of the line system.

The three Government installations are not confined to a specific Government service, but are available for the public service within the country and occasionally, on emergency, for communication with the exterior.

The War Department have seven subsidiary, or portable, installations for use at the five military centres and on the armed patrol steamers.

ADMINISTRATION.

There are no special laws or regulations affecting the subject, but the text of the Convention referred to above will be found below.

A—Convention between Paraguay and Argentina.

CONVENTION.

A The following is the text of a Convention entered into between the Governments of Paraguay and the Argentine Republic.

Date of the Convention,
November 15th, 1918.

Plenipotentiaries—

For Paraguay: Dr. Eusebio Ayala.

For Argentina: Dr. José Maria Cantillo.

After an interchange of credentials, which were found in order, the following agreement was signed, the object of which is to facilitate communication between the two countries mentioned.

1. For the telegraphic interchange between Argentina and Paraguay radiotelegraphic methods will be used as an auxiliary whenever—owing to the amount of traffic or breakdowns in the terrestrial lines—it may become necessary to use wireless in order to maintain an uninterrupted service.

2. Both the Argentina and the Paraguay offices will use for the exchange of messages the Posadas and Formosa stations, one at a time, or the two if necessary. The two manage-

ments will see to it that the traffic is distributed in such a way as to ensure the quickest service between the hours between 12 noon and 12 midnight, Argentine time. The wavelengths will be of the standard damped type of 600 metres.

3. Whenever it is required, and should it be impossible to carry through the exchange over the stations named in the preceding article, the service may be taken off directly between Buenos Aires and Asuncion.

4. In all matters referring to transmission rates, accounts and service regulations, the Argentine and Paraguay regulations at present in force in the telegraphic service will apply.

5. This convention will come into effect thirty days after its ratification by the contracting parties, and either party may withdraw at any time by giving 90 days' notice previous to the date when the suspension of the service is intended to take effect.

This convention is made out in duplicate and signed by the two plenipotentiaries whose seals have been affixed, and they have agreed that the exchange of the ratification will take place in the city of Asuncion within thirty days from this date.

PERSIAN GULF

(See Maps 3, 16 and 21)

Including: Oman, Bahrein Islands, Aden, Perim, Sokotra, and the Kuria Murai Islands.

OMAN is an independent State in South-Eastern Arabia, whose integrity has been guaranteed by Great Britain and France. Sultan Seygid Taimur bin Feysil is the reigning head.

Aden is an important coaling station for ships voyaging to and from the East.

CONTROL AND ORGANISATION.

The stations are under the control of the Indo-European Telegraph Department of the Government of India.

ADMINISTRATION.

There are no local laws or regulations applying to wireless telegraphy the Persian Gulf.

PERU

(See Maps 49, 50 and 52)

CONTROL.

THE control of radiotelegraphy is directed by the Minister of the Interior.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Sir William Slingo	Administrator-General Posts and Telegraphs ..	Lima
Mr. R. Ricci	Superintendent of the Radiotelegraph Service ..	Desamparados 187 (Lima), Central Office

By virtue of an agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., on May 1st, 1921, took over the administration of the Postal, Telegraph and Radiotelegraphic Services of the Republic and will operate them for a period of twenty-five years, Sir William Slingo, late Engineer-in-Chief of the British Post Office, having been appointed Administrator-General.

The concession includes the sole and exclusive operation of all national and international wireless telegraph stations within the Republic and the exclusive right to erect any further wireless stations that may be necessary.

In accordance with the terms of the above agreement, a programme of reconstruction and reorganisation of the radio service is being carried out.

There are at present no weather, meteorological, hydrographic or press services. A time signal service is in operation in Lima, at 1 p.m. daily, seventy-fifth meridian time, a time-ball is dropped from the mast of San Cristobal wireless station in accordance with the wireless signal received from the U.S. Naval station at Darien (Canal Zone). There are no direction finding stations.

ADMINISTRATION.

The following rules and regulations are at present in Peru:—

A—Decree dated January 14th, 1921.

B—Decree dated May 15th, 1922.

C—Law No. 2263 concerning Ship Stations.

DECREE DATED JANUARY 14TH, 1921.

A Considering:—

1. That, according to the laws of the Republic, the national services of posts and telegraphs and other similar services form a monopoly, the exploitation of which is in the hands of the State;

2. That the modern system of wireless telegraphy and telephony should, owing to their nature, be included in the said monopoly because they give the same services as the ordinary electric telegraphy, the only difference between the two being the means of transmission; and,

3. That the recent war of nations has shown the necessity that Governments should supervise the telegraphic installations of whatever kind

they may be, under their respective jurisdictions, this being the only way to avoid clandestine communications which might compromise the neutrality of the nation and endanger its sovereignty.

It is decreed:—

Art. 1. Only the State may exploit, within the territory of the Republic, the systems of telegraphy and telephony known by the names of "wireless telegraphy and telephony" and "radiotelegraphy and radiotelephony."

Art. 2.—The Executive Power only will be able to concede specially limited permission for the establishment of small wireless telegraph and telephone stations for scientific training, experiments or local service, it being understood that these offices will always be subject to official inspection, supervision and regulation.

ART. 3.—On the denouncement and verification of any clandestine installations by the departmental authorities, the Ministry of Government is authorised to proceed to the immediate destruction of the same without any right of claim on the part of the interested parties.

DECREE DATED MAY 15TH, 1922.

B It being necessary to regulate the concession of authorisations for the installation and use of small radiotelegraphic or radiotelephonic stations, intended for instructional purposes, scientific experiment, or given determined local services; in conformity with Art. 2 of the Supreme Decree of the 14th January, 1921, it is resolved that, when the Government grants a licence for the installation of small radiotelegraphic or radiotelephonic stations, it will be made under the following conditions:—

1. Every transmitting station must be equipped with a receiving apparatus.

2. Applicants must produce proofs of their nationality and two references written by persons of Peruvian nationality who are not relatives.

3. The installation must be approved by the Administrator-General of the Radiotelegraphic Service.

4. Absolute secrecy must be kept of all correspondence received by means of the apparatus.

5. The applicants must show to the Administrator of the Service that the station is desired for scientific purposes or for public utility. If they contemplate scientific investigation they must present certificates from some Government department or some recognised scientific body that they are competent investigators.

6. Every transmitting station must be under the control of a person holding a certificate of competency from the Administrator-General of the Service, or possessing—

(a) Sufficient knowledge for the regulation and control of the apparatus with which it is desired to work.

(b) A knowledge of the regulations of the International Convention, not only as regards the prevention of interference, but also as regards the duties imposed upon operators.

(c) Prove a speed in the transmission and reception of not less than twelve words per minute (Morse code).

When it is necessary to examine an applicant in the qualifications referred to a fee of \$5.00 will be charged.

Should the licensee not possess the required qualifications he may, under exceptional circum-

stances, be allowed to employ a qualified operator to work the transmitting and receiving apparatus.

7. It has been decided to charge small fees to cover staff and inspection expenses. For every station with power not exceeding 10 watts \$10.00 will be charged as initial fee, plus an annual fee of \$20.00. In total, \$30.00 for the first year and \$20.00 for each succeeding year. These fees cover both installations—transmitting and receiving. For more powerful installations higher fees will be charged.

8. Transmission will only be permitted to specified and duly authorised stations, and in any case the number of these must not exceed five. Written authorisations must be obtained from the proprietors of the stations with which communication is to be made.

AERIALS.

The height and maximum dimensions of these must be as follows:

Maximum height of aerial above ground, 100 feet.

Total length of wire, including lead-in wire, 100 feet for single wire aerials, and 140 feet where two or more wires are used, *e.g.*, total length of double wire, 70 feet.

9. *Portable Installations.*—The general conditions are the same as for fixed stations. The power of these stations is limited generally to 10 watts, and their use will ordinarily be permitted within a radius of 10 miles from a fixed point.

LAW No. 2263.

C ART. 1.—Steamers of one thousand five hundred tons displacement or over, engaged especially in the transport of passengers, that touch in ports of the Republic, must be equipped with radiotelegraphic installations with a transmitting range of at least 300 miles, and a competent staff to attend to the service of wireless communication with every class of ship and with the stations established, or in future to be established on our coast. These installations must meet with the satisfaction of the inspecting engineer appointed by the Executive Power.

ART. 2.—A limit of six months, counted from the promulgation of this law is fixed for the steamship companies in the Pacific to comply with the obligation imposed in Article 1, under the penalty of their steamers not being admitted to any of the ports of the Republic.

ART. 3.—The present law relates to companies having permanent service established in the Republic.

PHILIPPINE ISLANDS

(See Maps 22 and 23.)

THE Philippine Islands belong to the United States of America, but the country has a representative and practically autonomous government. The members of the Senate and House of Representatives are all Filipinos elected by popular vote.

ORGANISATION AND CONTROL OF WIRELESS STATIONS.

There are twenty-four land stations owned and operated by the Insular Government, all of which are open for general public service. One of these stations, Zamboanga, in the Island of Mindanao, works with the British North Borneo Government station at Sandakan.

The entire radio system, except a few stations of the United States Army and Navy, are controlled by the Government of the Philippine Islands and form a part of the telegraph cable and postal system of the Insular Government. Some of the stations operated by the United States Army and Navy are also open to ship and foreign traffic.

The stations of the Philippine Government are designed primarily for commercial business. Those at Batangas, Iloilo, Cebu and Malabang serve as an auxiliary to the telegraph and cable system.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Hon. C'priano E. Unson	Actg. Sec. Dept. of Commerce and Communication ..	Manila
Mr. José Topacio ..	Dir. of Bureau of Posts	Manila

ADMINISTRATION.

Bills similar to the Radio Act and the Ship Act of the United States, regulating radio communication and requiring radio apparatus on certain passenger-carrying vessels, respectively, have been submitted to the Philippine Legislature for sanction.

The radio laws and regulations of the United States are conformed to or as far as local conditions permit.

POLAND

(See Maps 3 and 8)

CONTROL.

THE control and administration of wireless telegraphy in the Republic of Poland is under the direction of the Ministry of Posts and Telegraphs.

STATIONS.

There are now three transmitting stations in operation at Posen, Warsaw and Grudziadz, and further stations for internal communications are under construction or projected.

ADMINISTRATION.

The first diet of the Republic of Poland passed a statute in May, 1919, under which radiotelegraphy and telephony was made a Government monopoly. The development of radiotelegraphy has necessitated the addition of new clauses to this statute which, after receiving the sanction of the legislation authorities, will authorise the Ministry of Posts and Telegraphs to grant licences for the construction, ownership and use of wireless stations.

PORTO RICO

(See Map 45)

CONTROL AND ORGANISATION.

THE regulation of wireless telegraphy rests in the hands of the Department of Commerce for private stations and in the hands of the United States Navy Department for the Naval Section.

The Laws and Regulations affecting the Naval Radio Stations in Porto Rico are as follows :—

The International Radio Convention ;
The National Radio Laws of the United States ; and the
Navy Regulations and Communication Instructions.

(See under U.S.A.)

PORTUGAL

(See also Maps 2, 10, 24 and 33.)

Including: Cape Verde Islands, St. Thomé and Príncipe, Azores.

ON October 5th, 1910, the Republic was proclaimed, and on August 20th, 1911, the present constitution was established. Affairs are administered by a President, the two Chambers reserving to themselves the legislative functions.

CONTROL.

The radiotelegraphic service in Portugal is a state monopoly. No private individual is allowed to erect or work wireless, and may not even own a simple receiver. The only exception made is that in favour of shipping companies, which are allowed to have wireless stations on board their vessels.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. João Alberto Pereira de Azevedo Neves	Minister of Commerce	Lisbon
Sr. Henrique Jacinthe Ferreira de Carvalho	Postmaster-General	Lisbon
Colonel Alvaro Cesar de Mendonça ..	Minister of War	Lisbon
Sr. Manuel Alves de Mattos	Inspector of Telegraphic Military Service	Lisbon
Dr. Alexander de Vasconcellos e Sá ..	Minister of Colonies	Lisbon
Admiral Canto e Castro	Minister of the Navy	Lisbon
Admiral D. Bernardo da Costa	President of the Technical Committee of Torpedoes and Electricity	Lisbon

ADMINISTRATION.

The current laws and regulations reprinted below comprise :—

A—Act of July 15th, 1913.

B—Regulations.

C—Decree of April 18th, 1916.

D—Decree of March 29th, 1917.

THE ACT OF JULY 15TH, 1913.

A 1. On the expiration of a period of three months from the approval of the Regulations for the execution of the present law, no Portuguese steam vessel, with accommodation for more than fifty passengers (including crew), shall be permitted to sail from any port without having installed a wireless telegraph apparatus of the system which suits it best, in good working order, and capable of despatching and receiving radiotelegrams within a radius of action which must never be less than 100 miles.

(a) From this provision those steamers are excepted which navigate only between ports situated at distances of less than 200 miles,

(b) For steam vessels, which navigate in the Colonies where there are coastal radiotelegraph stations, and which only occasionally come to the Metropolis, the period granted for the installation of wireless telegraphy, to which the present article refers, shall be six months.

2. The wireless telegraph material of a vessel, and the respective service of transmission and reception of radiotelegrams, shall be under the charge of one or more duly qualified telegraphists.

§ The number of telegraphists, their qualifications, and that of the indispensable auxiliary staff, the organisation of their technical instruction, provisions with respect to the service of supervision, conditions of the installation of the apparatus, and the official verification of their working shall be determined pursuant to the Regulation drawn up for the execution of the present law.

3. It is the province of the captain of the vessel to give instructions and orders for the complete carrying out of the laws and regulations in force with respect to the radiotelegraphic service, and he shall exercise the necessary supervision, carrying out and causing to be carried out any provisions which he may consider advantageous for the good working of the said service.

4. The captain shall be held responsible for any negligence in complying with the requirements of Article 1, and on conviction he shall be liable to a fine not exceeding Rs. 200 and the suspension of his master's certificate for one year.

5. Negligence or failure on the part of the captain to carry out the provisions of Article 3 shall render him liable to a fine not exceeding Rs. 50, which may be accompanied with imprisonment not exceeding one month after the first offence.

6. If there should be a disaster, stranding or loss of the vessel, resulting from the lack of vigilance of the telegraph staff, and the said fault was due to the negligence of the captain in failing to carry out and causing to be carried out the provisions in force relating to the radiotelegraph service, the captain shall be liable to a fine not exceeding Rs. 200, accompanied or not, according to the gravity of the offence with suspension of his certificate for a period of from one to five years.

If the serious injury, or the death, of one or more persons should result from the disaster, the penalties applicable shall be respectively those laid down in Articles 368 and 369 of the Penal Code.

7. The offences referred to in Articles 4, 5 and 6 constitute maritime crimes, and shall be judged by the Commercial Maritime Tribunal pursuant to the disciplinary Code of the Mercantile Marine.

8. All the wireless apparatus intended for Portuguese vessels shall be exempt from Customs and Municipal Duty.

9. Any legislation contrary hereto is hereby repealed.

REGULATIONS.

B The following regulations were issued on August 29th, 1913:—

1. Ships may be equipped with any wireless telegraph apparatus which is in keeping with scientific progress.

2. The shipping or any other company may establish and work a wireless telegraph station on board ship. The station must possess a licence granted by the Government of the nationality to which the ship belongs. The "class" of the station is mentioned in the licence.

3. There are three classes:—

(a) Long voyage passenger steamers with accommodation for more than 150 passengers must maintain continuous service.

(b) The same type of steamer with accommodation for less than 150 passengers must maintain continuous receiving service, whereas the transmission may be limited.

(c) Cargo or fishing boats, or vessels carrying more than 50 persons (including crew), may have limited service.

4. and 5. Wavelength of 300 m., 600 m., and more than 1,800 m. may be employed. Small boats may work on a 300 m. wave when sending, but 600 when receiving. The waves must be as pure and as undamped as possible.

The oscillator must not be directly connected to the antennæ, except in case of distress, or on certain small steamers where the energy employed in the primary does not exceed 50 watts.

6. The cabin must be divided into two parts so that the transmitting gear and the spark gap may be separated from the receiving apparatus. Double walls must be used to isolate the interior from the exterior.

7. The instruments must be able to receive and send 100 letters per minute.

8. New installations employing a power of more than 50 watts must possess such arrangements as will enable them to have a range inferior to their normal, the smallest being approximately 15 miles. All old stations must be brought to this standard as soon as possible.

9. The receiving instruments must be able to tune for waves up to 600 m., being highly protected against disturbances.

10. The power measured at the terminals of the generator must not exceed 1 kw. in normal circumstances. An increase is allowed when a station desires to communicate with a land station other than the nearest, at a distance of more than 200 miles from the nearest land station, and when, in exceptional circumstances, the communication cannot be effected with 1 kw.

11. First and second-class steamers must carry an emergency set in as safe a place as is possible. The emergency set must be able to work for six hours at least at a distance of 80 miles for first class, and 50 miles for second-class steamers.

12. The apparatus must be operated by a telegraphist who possesses a certificate from the Portuguese Government, or, in urgent cases

and for one trip only, from any other Government which has signed the International Convention:

13. There are two certificates:—

(a) 1st Class (same as International).

(b) 2nd Class (12 words, adjustment of apparatus, knowledge of each instrument and its work, and rules *re* handling of telegrams).

Service.—Any member of the crew able to assist the telegraphist in his work, and possessing a knowledge of the operation of the apparatus, may be an "auxiliary" operator.

14. Second-class telegraphists may be employed on board where the wireless service is only for the shipping company's requirements or on fishing vessels, or they may act as assistants in cases where there is already one first-class operator. On first-class steamers two first-class telegraphists must be employed.

15. On second-class steamers, one first-class and one second-class telegraphist should be employed; on third-class vessels one second-class telegraphist will suffice.

Service.—As long as land stations do not exist in the Portuguese Colonies, Portuguese steamers plying there are allowed to carry one first-class telegraphist and one "auxiliary."

16. Transmitting must be performed by a first or a second-class telegraphist, except in urgent cases.

17. The certificates state that the telegraphist has taken an oath of secrecy with regard to the correspondence.

18. The captain has authority over the working of the station.

19. Portuguese operators are preferred.

20. Should none be obtainable, foreigners may be employed if they are in possession of the Portuguese Government's certificate.

In urgent cases where no certificated telegraphist is available, provisional certificates may be issued for one voyage.

21. Certificates are supplied by the Commission after the examination of the telegraphist.

22 and 23. Captains are also bound by an oath of secrecy.

32. All telegrams sent and received on board must be registered by the captain on forms supplied by the Government. The date and hour of the sending or reception of these telegrams must be indicated.

33. Only the telegraphists and the captain are allowed to enter the wireless cabin.

34. The wireless room and the bridge must be connected by either a speaking tube or a telephone, unless they are within easy distance of one another.

DECREE OF APRIL 8TH, 1916.

C This decree forbids the installation of either wireless transmitting or receiving stations, but Government can authorise the setting up of receiving stations only.

These said stations, when authorised by Government, are subject to its control, and whenever Government may judge convenient, it may withdraw the same authorisations without any indemnification.

The owners of these stations have to pay in advance the tax of Escudos \$5.50 per annum.

Anyone who sells wireless material is obliged to send to the Government a statement of the material sold, with the names of the persons who have purchased it to identify them. Those who do not fulfil this identification will pay the fine of Escudos \$20.00 to \$100.00, and all the material that he has for sale will be

seized by the Government, and will belong to the Government. In case of a second offence he will be prosecuted.

The owner of any receiving station, or any person who may have made use of the same station, and who divulges contents of messages that have been received by such station incurs a penalty.

In case of a second offence he is subject to imprisonment for six months to a year, and a fine.

DECREE OF MARCH 29TH, 1917.

DIn consideration of the highest interest of the State, it is undesirable in the existing circumstances that private persons should possess wireless apparatus of any kind, or make use of the same apparatus.

It has been decided that it is desirable to confine the employment of such apparatus to schools of observatories, so as to limit the risk of misuse; and availing ourselves of the authorisation granted by the Executive Power by the Laws Nos. 373 and 491 of September 2nd, 1915, and March 12th, 1916.

We decree by the proposal of the Minister of Works and Social Providence, the following:—

ART. 1.—It is expressly forbidden to private persons to possess or make use of wireless apparatus and fittings, or to import or sell to the public the said apparatus and accessories.

ART. 2.—The owners—whatever they may claim to be its purpose—of apparatus and wireless accessories without conducting wires, will have to deliver the said articles for deposit against receipt; in Lisbon, at the warehouses of the Material of the Posts and Telegraphs; in Oporto, at the Secretary's Office of the Second Electric Circumspection; and in the other capitals of the administrative districts of the continent and adjacent islands, at the Secretary's Offices of the Electric Sections and Sub-sections or of the Post and Telegraph Service.

The deliveries in deposit to which this article refers will have to be effected for the Continent of the Republic, in the maximum period of five days from the date when this Decree is published in the "Diario do Governos"; for the adjacent islands in the same period reckoned from the date when the same daily paper reaches there.

ART. 3.—The apparatus and wireless fittings without conducting wire that are in the Government Teaching Institutions, and at the Astronomical and Meteorological Observatories, in the first case for the purpose of demonstration, and in the second case for scientific tests, are to be under the safe keeping of the directors of the same institutions and observatories, and will be used only for those purposes and in the presence of the said directors and under their entire responsibility, in the presence of the respective teachers and observers.

ART. 4.—He who transgresses the stipulations of this Decree incurs a penalty of Escudos \$20.00 to \$100.00, which will be fixed and collected by the Administration of Posts and Telegraphs; when it is paid voluntarily, the same Administration will order all the material to be seized, which will then belong to the Government.

In case of a second offence the fine will be fixed at its maximum.

If the fine is not paid voluntarily, the transgressors will be handed over to the judiciary, in order to be judged and the penalty imposed by the correctional police.

In Lisbon and Oporto the jurisdiction will concern the tribunal of transgressions.

ART. 5.—This Decree will come into force immediately, and will be valid to the end of the European War, after which the apparatus and wireless fittings which were voluntarily delivered will be returned to their owners, against receipt as to the conditions of Article 2.

ART. 6.—All legislation to the contrary is hereby revoked.

RHODESIA.

(See Maps 25, 31 and 32)

Including : Northern Rhodesia.

RHODESIA is under the administration of the British South Africa Company, and is divided up into Northern Rhodesia and Southern Rhodesia for administrative purposes.

CONTROL AND ORGANISATION.

Wireless telegraphy is under the control of the Department of the Administrator and the principal assistants of the Postmaster-General. There are at present no official wireless stations in operation, but authority has been given for the erection of small wireless telegraph installations at Bulawayo and Salisbury for experimental and instructional purposes. Several applications have been made for private wireless stations, and up to July, 1923, sixteen licences had been issued. The wireless sets installed in connection with the Cape to Cairo flight are to be maintained.

ADMINISTRATION.

Southern Rhodesia regulates radiotelegraphy within its border by the "Electric Telegraph Amendment Ordinance" of 1914, and sundry Notices of 1912, the text of which will be found below.

It is possible that legislation and regulations will become necessary in connection with aerial navigation which is now in course of development,

and efforts are being made to secure, as far as possible, uniformity with the proposed laws and regulations of the Union of South Africa on this subject.

No permanent arrangements have yet been made for the transmission of time and weather and meteorological signals.

- A—Electric Telegraph Amendment Ordinance, 1904.
- B—Postal Notice No. 55 of 1912.
- C—Government Notice No. 391 of 1912.
- D—Government Notice No. 278 of 1922 regarding the issue of licences.
- E—Form of Licence for Telephone Stations.
- F—Government Notice No. 84 of 1923 (Northern Rhodesia) regarding private transmitting and receiving stations.

TELEGRAPH (AMENDMENT) ORDINANCE.

A The term "electric telegraph" whenever used in the "Electric Telegraph Act, 1861," or any law amending the same or relating to "electric telegraphs," shall be interpreted as including any system or means of conveying signs, signals, or communications by electricity, magnetism, electro-magnetism, or other like agency, and whether with or without the aid of wires, and including the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of such system; and the term "line of electric telegraph" shall be interpreted as including any apparatus, instrument, mast, standard, wire, substance, matter, or thing whatever, which is, or may be, used for the purpose of sending, transmitting, conveying, or receiving such signs, signals, or communications.

2. The meaning of the term "person" shall be further extended so as to include individuals, partnerships, companies, and corporations.

3. The provision of the first section of the said Act as to its application to Southern Rhodesia shall be read and construed as including the territorial waters thereof.

4. Within Southern Rhodesia or the territorial waters thereof, no person not thereto expressly authorised by some law shall erect or make use of any mast, standard, or apparatus of any kind, for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism, or other like agency, or shall erect or construct any line of electric telegraph, except under a licence to be granted by the Administrator.

5. The Administrator may authorise the issue of a licence for the establishment or use of any apparatus or installation for the transmission of signs, signals, or communications, by electric telegraph, with or without the aid of wires, and may revoke the same at any time, and there shall be payable annually in respect of such a licence such sum not exceeding One Hundred Pounds sterling, as may be fixed by regulation.

6. The terms and conditions of such licence, and the duration thereof, shall be subject to such regulations as may from time to time be made by the Administrator.

7. Any person who shall establish or use, or attempt to establish or use, any such apparatus or installation as is mentioned in Sections 1 and 4 of this Ordinance, in contravention of the provisions thereof, of or any other law relating to electric telegraphs, or of any regulation thereunder, shall be liable upon conviction to forfeit all apparatus so used, and to a penalty not exceeding Two Hundred and Fifty Pounds, and, in default of payment, to imprisonment, with or without hard labour, for a period not

exceeding three months, and, in case of a second or subsequent conviction, in addition to such forfeiture to a penalty not exceeding Five Hundred Pounds, or in default of payment to imprisonment, with or without hard labour, for a period not exceeding six months.

8. Any Magistrate or Justice of the Peace before whom information shall be given on oath by credible persons, that the provisions of this Ordinance are being, or have been, or are likely to be infringed, may issue a search warrant, and authorise the seizure of any instruments, apparatus or appurtenances reasonably suspected to be intended for use in such contravention.

9. Notwithstanding the provisions of Section 4 of "The Electric Telegraph Act, 1861," all regulations made under the authority of that Act shall be published in the *Gazette*, and be subject, *mutatis mutandis*, to the provisions of Section 7 of Act No. 5 of 1883 of the Cape of Good Hope.

10. This Ordinance may be cited as the "Electric Telegraph Amendment Ordinance, 1904," and shall be read as one with "The Electric Telegraph Act, 1861," of the Cape of Good Hope, and the "Telegraph Protection Ordinance," 1901, and the said laws may be cited together as the "Electric Telegraph Laws, 1861 to 1904."

POSTAL NOTICE No. 55 OF 1912.

B Public attention is hereby directed to the provisions of the "Electric Telegraph Amendment Ordinance, 1904," under which no person not thereto expressly authorised by some law shall erect or make use of any mast, standard or apparatus of any kind for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism or other like agency, or shall construct any line of electric telegraph except under a licence to be granted by the Administrator.

The term "Line of Electric Telegraph" is defined as any apparatus, instrument, mast, standard, wire, substance, matter or thing whatever which is or may be used for the purpose of sending, transmitting, conveying or receiving signs, signals, or communications.

All persons having, or desiring to have, such lines of electric communication, including telephone lines, whether on their private property or otherwise, are hereby notified that application for licence to use such lines must be made to the Administrator through the Postmaster-General.

The licence fees payable in respect of such lines, as published in Government Notice No. 391 of 1912 are as follow :—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The licence does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

(c) £50 per annum for any installation of wireless telegraphy or telephony.

All persons having in use lines of electric communication which have not been authorised by the Administrator are hereby notified that unless the required permission be applied for within one month of the date of publication of this Notice they will render themselves liable to the penalties provided in Section 7 of the Telegraph Ordinance above referred to.

GOVERNMENT NOTICE.

No. 391 of 1912.

DEPARTMENT OF POSTS AND TELEGRAPHS.

The Treasury, Salisbury,

December 19th, 1912.

C It is hereby notified for public information that His Honour the Acting Administrator, with the advice of the Executive Council, has been pleased to approve of the following Regulations regarding the issue of licences for installations of private telephones, telegraphs, or other means of electric communication, whether with or without wires, in terms of section 5 of the "Electric Telegraph Amendment Ordinance, 1904."

By command of His Honour the Acting Administrator in Council.

P. D. L. FYN, Acting Treasurer.

When any person is authorised to establish or use any means of electric communication as defined in the "Electric Telegraph Amendment Ordinance, 1904," the Postmaster-General may issue to such person an annual licence for the use of such line on payment in advance of the undermentioned fees, namely:—

(a) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(b) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The licence does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

GOVERNMENT NOTICE.

No. 278.

7th July, 1922.

D It is hereby notified that under the powers conveyed by section 6 of the Electric Telegraph Amendment Ordinance, 1904, the following regulations in regard to the issue of licences for the establishment and operation of private wireless telegraph or telephone installations shall have effect from the date of this notice.

1. Section C of Government Notice No. 391 of 1912 is hereby cancelled.

2. No licence shall be issued except under the authority of the Administrator and on payment of such annual fee as may be specified therein, not exceeding one pound sterling,

3. Applications for licences must be addressed to the Postmaster-General, and must contain the following information:—

(a) The full name and occupation of the occupant;

(b) The address at which the apparatus is proposed to be installed;

(c) A full description of the apparatus, with such diagrams as may be required;

(d) The purpose for which the apparatus is proposed to be used; and

(e) Generally such other information as may be required by the Postmaster-General.

4. An applicant may further be required:—

(a) To produce evidence of British birth or nationality;

(b) To furnish two approved written references as to character;

(c) To satisfy the Postmaster-General by examination or otherwise that he has attained a knowledge of the regulations of the International Radiotelegraphic Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators, and that he can read by sound Morse signals at the rate of 12 words per minute; and

(d) To satisfy the Postmaster-General that he has in view some definite object of scientific value or general public utility.

5. Each licence issued under these regulations shall contain a schedule setting forth:—

(a) The maximum power which may be used;

(b) The maximum wavelength;

(c) The maximum dimensions of the aerial;

(d) The stations, if any, with which communication may be established; and

(e) Such other details as may be required.

And the licensee shall not at any time exceed or vary the limits or conditions therein laid down except with the consent in writing of the Postmaster-General.

6. The granting of any licence under these regulations shall not in any way vary or detract from the rights, powers or privileges of the Postmaster-General as defined by law or regulation, nor shall it involve any obligation or responsibility on the Postmaster-General for any matter or thing which may be done by the licensee or his agents.

7. All apparatus and plant installed under licence shall be subject to the approval of the Postmaster-General, and to inspection by any of his officers duly authorised thereto from time to time.

8. The licensee shall comply with all directions which shall be given to him by the Postmaster-General, and shall at any time cease to work, or shall completely dismantle the licensed apparatus and plant upon notice to do so in writing from the Postmaster-General.

9. The licensee shall not divulge to any unauthorised person, or make any use whatever of any message coming to his knowledge by means of his apparatus, and not intended for his use.

10. The licensee shall account to the Postmaster-General for any rates of fees that may be chargeable on any message passing through his apparatus.

11. Except with the consent in writing of the Postmaster-General the licensee shall not permit the use of his apparatus by any other person nor shall he assign or dispose of any rights, powers or privileges granted to him by licence.

12. The Postmaster-General may at any time give notice in writing to determine any licence granted under these regulations.

DEPARTMENT OF POSTS AND
TELEGRAPHS.

SOUTHERN RHODESIA.

LICENCE TO ESTABLISH AND WORK A PRIVATE
WIRELESS TELEPHONE STATION.

E Under the powers conveyed by section 6 of the "Electric Telegraphs Amendment Ordinance, 1904," and "Government Notice No. 278 of 1922," a licence is hereby issued to

to establish and work apparatus for wireless at
provided such apparatus shall be of the character specified in the schedule hereto.

The licensee agrees to abide by the regulations regarding the working of wireless installations as published by Government Notice No. 278 above referred to, and to carry out any of the requirements of the Postmaster-General as therein laid down.

General Post Office, Salisbury.

.....19....

Postmaster-General.

.....
.....*Licensee.*
.....place.
.....date.

SCHEDULE.

To licence granted to.....

to establish and work apparatus for

of wireless signals.

- (a) Maximum power, 10 watts.
- (b) Maximum wavelength, 50 metres.
- (c) Maximum dimensions of aerial :—
 - i. Maximum height above ground, 100 ft.,
 - ii. Total length of aerial, including leading-in wires—
 - (a) 100 ft. for single wire aerial.
 - (b) 140 ft. where two or more wires are used, e.g., total length of 70 ft. of double wire.

(d) Stations with which communication may be established :—

Postmaster-General.

General Post Office, Salisbury.

.....1923.

THE BRITISH SOUTH AFRICA COMPANY

ADMINISTRATION OF NORTHERN RHODESIA.

Government Notice No. 84 of 1923.

It is hereby notified for public information that under and by virtue of the powers conferred upon him by sub-section *three* of section *thirteen* of "The Northern Rhodesia Telegraphs Proclamation, 1914" His Honour the Administrator has been pleased to prescribe the following terms and conditions upon which licences to import, keep, use or establish any apparatus or installation for transmission of messages by wireless telegraphy will, if at all, be granted.

By command of His Honour the Administrator
Richard Goode,

Secretary.

Livingstone
5th July, 1923.

1. No licence shall be issued except under the authority of the Administrator and on payment of an annual fee of one pound sterling (£1).

2. Applications for licences must be addressed to the Comptroller of Posts and Telegraphs, and must contain the following information :

(a) The full name and occupation of the applicant.

(b) The address at which the apparatus is proposed to be installed.

(c) A full description of the apparatus, with such diagrams as may be required.

(d) The purpose for which the apparatus is proposed to be used : and

(e) General such other information as may be required by the Comptroller of Posts and Telegraphs.

3. An applicant may further be required—

(a) To produce evidence of British birth or nationality.

(b) To furnish two approved written references as to character ;

(c) To satisfy the Comptroller of Posts and Telegraphs by examination or otherwise that he has attained a knowledge of the regulations of the International Radiotelegraphic Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators, and that he can read by sound Morse signals at the rate of twelve words per minute ; and

(d) To satisfy the Comptroller of Posts and Telegraphs that he has in view some definite object of scientific value or general public utility.

4. Each licence issued under these regulations shall contain a schedule setting forth—

(a) The maximum power which may be used ;

(b) The maximum wavelength ;

(c) The maximum dimensions of the aerial ;

(d) The stations (if any) with which communication may be established ; and

(e) Such other details as may be required ; and the licensee shall not at any time exceed or vary the limits or conditions therein laid down, except with the consent in writing of the Comptroller of Posts and Telegraphs.

5. The granting of any licence under these regulations shall not in any way vary or detract from the rights, powers or privileges of the Comptroller of Posts and Telegraphs as defined by law or regulation, nor shall it involve any obligation or responsibility on the Comptroller of Posts and Telegraphs for any matter or thing which may be done by the licensee or his agents.

6. All apparatus and plant installed under licence shall be subject to the approval of the Comptroller of Posts and Telegraphs, and to inspection by any of his officers duly authorised thereto from time to time.

7. The licensee shall comply with all directions which shall be given to him by the Comptroller of Posts and Telegraphs, and shall at any time cease to work or shall completely dismantle the licensed apparatus and plant upon notice to do so in writing from the Comptroller of Posts and Telegraphs.

8. The licensee shall not divulge to any unauthorised person or make any use whatever of any message coming to his knowledge by means of his apparatus and not intended for his use.

9. The licensee shall account to the Comptroller of Posts and Telegraphs for any rates or fees that may be chargeable on any message passing through his apparatus.

10. Except with the consent in writing of the Comptroller of Posts and Telegraphs, the licensee shall not permit the use of his apparatus by any other person, nor shall he assign or dispose of any rights, powers or privileges granted to him by licence.

11. The Comptroller of Posts and Telegraphs may at any time give notice in writing to determine any licence granted under these regulations.

DEPARTMENT OF POSTS AND
TELEGRAPHS,
NORTHERN RHODESIA.

LICENCE TO IMPORT, KEEP AND ESTABLISH AND
WORK A PRIVATE WIRELESS APPARATUS.

Under the powers conveyed by section *thirteen* of "The Northern Rhodesia Telegraphs Proclamation, 1914" and Government Notices No. 84 of 1923 a licence is hereby issued to

to import, keep, establish and work apparatus or installation for transmission of messages by wireless telegraphy at

provided such apparatus shall be of the character specified in the schedule hereto.

The licensee agrees to abide by the regulations regarding the working of wireless installations as published by Government Notice No. 84 above referred to and to carry out any of the require-

ments of the Comptroller of Posts and Telegraphs as therein laid down.

General Post Office, Livingstone.

.....192..

Comptroller of Posts and Telegraphs.

.....
Licence.
..... Place.
..... Date.

Regd. No.

SCHEDULE

to licence gr nted to

to establish and work apparatus for transmission of wireless signals.

(a) Maximum power ;

(b) Maximum wavelength ;

(c) Maximum dimensions of aerial :

1. Maximum height above ground ;

2. Total length of aerial, including leading-in wires

(d) Stations with which communication may be established :

Comptroller of Posts and Telegraphs:

General Post Office, Livingstone,

.....19.....

ROUMANIA

(See Maps 3 and 14).

THE country was formed by the fusion of the two Principalities of Moldavia and Wallachia in 1861. The present Ruler is King Ferdinand I.

CONTROL.

All wireless telegraphic or telephonic services and stations are owned and operated by the State. The control is in the hands of the Directorate of Radio Communication, a branch of the Ministry of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
M. Emile Giurgea, D. Sc.	Director of Radio Communication	Str. Renasterei, 6, Bucharest
M. Emil Geles	Radio Engineer	Bucharest
M. Aurel Demetresco	Laboratory Engineer.. ..	Bucharest
M. André Bruneano	Engineer-in-charge of the Station.. ..	Herastrau Bucharest

ORGANISATION.

During the war, when Bucharest was cut off from telegraphic communication with the West, an improvised station was erected in Para Carol, south of Bucharest, to receive press bulletins and to transmit urgent official correspondence. Other stations of higher power were erected at Baneasa and Herastrau, which, upon the evacuation of Bucharest in November, 1916, were dismantled and re-erected at Vaslui and Botesani. Subsequently the latter station was removed to Jassy, where communication with Paris, Lyons, Coltano, Salonica and other stations was maintained during the remainder of the war. (For fuller particulars see THE YEAR BOOK for 1923). After the Armistice the principal station at Herastrau, which had been destroyed, was rebuilt, eight towers (130 metres in height) being erected in place of the former 100-metre towers, which had been removed.

The projected scheme of the Ministry of Communications, part of which is already completed, comprises :—

- (1) A 100 kW. (output) station at Herastrau (near Bucharest) for long-distance correspondence. This station is now finished, with the exception of the automatic transmitting and receiving apparatus, and will shortly be in operation.

- (2) A 5 kW. (output) valve station at Herastrau for communicating with neighbouring countries.
- (3) A 2 kW. (output) mobile valve station for internal communication, and for use as an emergency station, in the event of a breakdown at other places in the system. This is now finished, and will soon be in operation.
- (4) A $1\frac{1}{2}$ kW. (input) valve station in Bucharest for communication with Roumanian stations and ports, which will soon be in operation.
- (5) A 5 kW. (output) valve station to be erected at Jassy.
- (6) A 6 kW. (input) station at Timisoara, Cluj and Constantza. At the latter place a 1 kW. station has been working for more than a year, and is now being replaced by a $1\frac{1}{2}$ kW. valve installation. The station at Timisoara is in course of erection.
- (7) A 2 kW. (output) station to be erected at Cernowitz and Galatz.
- (8) A $1\frac{1}{2}$ kW. (input) station at Oradea Mare, which is now finished, and will soon be in operation.
- (9) A $\frac{1}{4}$ kW. station to be erected at Kichenew and Craiova.
- (10) Low power stations at T-Severin, Giurgiu, Cernovoda, &c.
- (11) $\frac{1}{4}$ kW. sets now installed on board the Roumanian cargo boats.

The necessary land for the stations under construction has been procured, and the buildings are being erected. The aerial masts are under construction, and it is anticipated that the whole system will be completed by the end of next spring. A training school for the personnel of all these stations has been organised. The laboratories are fitted up and will shortly be considerably enlarged.

As soon as the principal stations are erected the Department of Radio Communication will turn its attention towards the organisation of private transmitting stations, amateur reception, broadcasting, etc.

The old wireless legislation is being revised, and a new set of Laws and Regulations will shortly be drawn up to conform with modern requirements.

SAINT HELENA

(See Maps 24 and 33)

Including : Tristan da Cunha.

ST. HELENA is an Admiralty coaling station and a resting place for the Eastern Telegraph Company's cable between Cape Town and St. Vincent (Cape Verde Islands).

Tristan da Cunha is a small group of islands in the Atlantic half way between the Cape of Good Hope and South America. At present there is no wireless communication, but efforts are being made to erect a set suitable for communication with the outer world.

ADMINISTRATION.

Wireless Telegraphy is administered under the following Ordinance and Regulations:—

A—Wireless Telegraphy Ordinance, No. 2 of 1913.

B—Regulations.

WIRELESS TELEGRAPHY ORDINANCE. No. 2 OF 1913.

A *In the Fourth Year of the Reign of His Majesty King George V.
Major Harry Edward Spiller Cordeaux,
Companion of the Most Honourable Order of the Bath;
Companion of the Most Distinguished Order of Saint Michael and Saint George;
Governor and Commander-in-Chief. 14th July 1913*

An Ordinance to provide for the regulation of wireless telegraphy

Be it enacted by the Governor of St. Helena as follows:—

I. This Ordinance may be cited as the "Wireless Telegraphy Ordinance, 1913."

II. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

III. A person shall not establish any wireless telegraphy station or install or work any

apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

2. Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

IV. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

V. The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

2. The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

3. If at any time, in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

VI. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a licence in that behalf, or contrary to the provisions of any regulations made under this Ordinance, or of any licence granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

VII. (1) any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding £50, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

2. Proceedings shall be taken before the police magistrate on the complaint of the chief

of police or of any other person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

VIII. "The Wireless Telegraphy Ordinance, 1912," is hereby repealed.

GOD SAVE THE KING!

Given under the Public Seal of the Island of St. Helena this 14th day of July, 1913.

By command of His Excellency the Governor,

(Signed) A. HANDS,
Chief Clerk.

REGULATIONS.

Made by the Governor-in-Council under Ordinance No 2 of 1913 entitled "An Ordinance to provide for the Regulation of Wireless Telegraphy"

B

I. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

II. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

III. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

IV. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

V. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

VI. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor in Council this 14th day of July, 1913.

(Signed) A. HANDS,
Chief Clerk

SALVADOR

(See Map 44.)

THE independent Republic of El Salvador is on the West Coast of Central America.

The form of Government is Republican, democratic and representative, with three branches of Administration: (1) The Executive, which comprises the President and Cabinet Ministers; (2) the Legislature or National Assembly; and (3) the Judiciary.

CONTROL AND ORGANISATION.

The only wireless station is at the southern end of the city of San Salvador, near the military post "El Zapote." The station was presented by the Government of Mexico, and is known by the name of "Estación Venustiano Carranza." It is open to public correspondence with ships.

Radiotelegraphy is a State monopoly and is under the control of the Telegraph and Telephone Administration, one of the departments of the "Ministerio de Gobernacion y Fomento." Private companies or individuals are permitted under licence from the Government to erect and work wireless telegraph and telephone stations provided the present contract with the Cable Company is not infringed.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Señor Dr. don Arturo Argüello Loucel	Minister of Public Works	San Salvador
Señor Don Ricardo Posada ..	Director of Telegraphs	San Salvador

ADMINISTRATION.

At present there are no special laws regulating wireless telegraphy, and the only publication which deals with this subject is the *Revista Telegrafica*, the official organ issued by the Director-General of Posts and Telegraphs, wherein are reported any such notices and items.

SAMOA ISLANDS

(See Maps 56.)

SAMOA (or Navigator Islands) is a group consisting of nine Islands in addition to rocks and islets. Only four islands are of any size; Savaii, Upolu, Tutuila and Manua, the two latter and all other islands east of the 171st degree West Long. are known as American Samoa, and are controlled by the Navy Department of the United States of America.

When the treaty of Peace was signed the German Government renounced all right and title to the territory of Western Samoa. It was agreed between the Allied and associated Powers that this territory be administered by His Majesty in his Government of the Dominion of New Zealand, Major-General F. S. Richardson, C.B., C.M.G., C.B.E., being appointed Administrator by the Governor-General of New Zealand.

CONTROL.

The New Zealand Post and Telegraph Department is responsible for the administration of wireless telegraphy in Western Samoa.

ORGANISATION.

There are now four stations in the Samoa Islands, Apia Radio, Tutuila, Ofu and Tau.

Apia-Radio has two transmitting sets (Telefunken) a 50 kW. and 8 kW. The station is in direct communication with New Zealand every few hours daily, and is also responsible for relaying Tahiti, Rarotonga and Nukualofa traffic to and from New Zealand.

Weather reports are transmitted daily at 1100 G.M.T. on 600 metres, and during the hurricane season (November to April) an additional transmission is made at 1430 G.M.T. on 2,000 metres. These are compiled by the Director of the Samoan Observatory at Apia.

Tahiti, Nukulofa Suva, New Hebrides and Norfolk Island weather reports are also collected by Apia and retransmitted to "all Ships" at the routine times together with Apia's report.

ADMINISTRATION.

The administration is exactly the same as that of New Zealand. The Governor-General of New Zealand having extended the Post and Telegraph Act 1908, with its amendments to apply to Samoa in the same manner as if that territory were part of New Zealand, the term New Zealand as used in that act to be construed as including Samoa. (See under *New Zealand*.)

SEYCHELLES ISLANDS

(See Maps 21 and 25)

THIS Colony consists of a group of islands belonging to Great Britain, and under the administration of a Governor.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Brig.-Gen. Sir Joseph Byrne, K.B.E., C.B.	Governor and Commander-in-Chief	Mahé
His Honour P. B. Petrides	Chief Justice	Mahé
Hon. J. L. Devaux	Legal Adviser and Crown Prosecutor	Mahé
Hon. D. F. Watson	Treasurer and Collector of Customs	Mahé
Dr. J. B. Addison, O.B.E.	Chief Medical Officer	Mahé
Mr. G. S. Follows	Private Secretary	Mahé

ADMINISTRATION.

Radiotelegraphy is administered under the Ordinances, the text of which will be found below, and which cancel "The Telegraphic and Electrical Stations Ordinance, 1903," printed in our former issues.

There are no private or commercial wireless installations.

The list of current rules here included is as follows :—

A—Ordinance No. 3 of 1914.

B—Ordinance No. 11 of 1917.

C—Regulations (No. 127) thereunder.

ORDINANCE NO. 3 OF 1914.

Dated February 19th, 1914.

Enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof.

A To provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1914."

2. In this Ordinance and in any regulation made thereunder the expression "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British registered in the ship Colony.

4. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor in Executive Council may determine and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding two thousand rupees (Rs. 2,000) or to imprisonment for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance without the previous sanction of the Crown Prosecutor.

(2) If the Chief Justice or the Police Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy

has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor in Executive Council may make regulations for all or any of the following matters:—

(i) for prescribing the form and manner in which applications for licence under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any licence;

(ii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof and so as to not interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting except with the special or general permission of the Postmaster of the Colony the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the Colony;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships whether British or foreign in the waters of the Colony the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraph (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper but shall not be subject to any rent or royalty.

8. Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of one thousand Rupees (Rs. 1,000).

9. Ordinance No. 4 of 1903 is hereby repealed.

ORDINANCE NO. II OF 1917.

AN ORDINANCE TO AMEND ORDINANCE No. 3 OF 1914.

Dated September 1st, 1917.

B Be it enacted by the Governor of the Colony of Seychelles by and with the advice and consent of the Legislative Council thereof, as follows:—

1. This Ordinance may be cited as "The Wireless Telegraph (Amendment) Ordinance, 1917," and shall be construed as one with the Wireless Telegraph Ordinance, 1914.

2. Section 6 (iv) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed and replaced by the following:—

(iv) For prohibiting except with the general or special permission of the Governor, the working or using of any apparatus for wireless telegraphy on board any ship whether British or foreign other than His Majesty's ships of war, whilst such ship is in the waters of this Colony and for the control or disposal of any apparatus, instrument or thing which may be used in connection with wireless telegraphy on board any ship (other than His Majesty's ships of war) whilst such ship is in the waters of the Colony.

3. Section 6 (2) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed.

4. (1) The Governor may appoint officers for the purpose of seeing that the provision of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder are complied with and it shall be lawful for such officers to go on board any ship whether British or foreign whilst any such ship is at anchor in the waters of the Colony to see that such provisions are complied with.

(2) If any such officer is molested, obstructed, hindered or insulted while in the execution of his duties an offence shall be deemed to have been committed.

5. For the purpose of any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, or under any regulations made thereunder, the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship and for any breach of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder.

6. Any summons or other document in any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. The regulations published in *Gazette* No. 22 of 1914 under Government Notification No. 52 of 1914 are hereby repealed.

Passed in the Legislative Council at a meeting held on the 27th August, 1917.

REGULATIONS.

No. 127 of 1917.

C 1. The radiotelegraph stations on board ships (other than His Majesty's ships of war) shall not be worked whilst such ships are within any harbour or bay of the Colony.

2. For the proper enforcement of section 1 of these regulations ships of British register

in any harbour or bay of the Colony must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

3. (1) Ships of foreign register in any harbour or bay of this Colony must, subject to the provisions of sub-section 2 of this section take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(2) Ships of foreign register remaining in a harbour or bay of this Colony for less than twelve hours may, at the discretion of the

Governor, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of section 2 of these regulations.

4. Any officer appointed under the provisions of section 4 of Ordinance No. 11 of 1917 may order that the radiotelegraph cabin on board any ship (other than His Majesty's ships of war) be sealed and he shall thereupon affix his seal to such cabin.

If any seal so affixed is removed or tampered with an offence shall be deemed to have been committed against these regulations.

Made by His Excellency the Governor in Executive Council at a meeting held on the 24th day of September, 1917.

SIAM

(See Maps 17, 18 and 23.)

THE Kingdom known to us as Siam, to the natives as Muang Thai, lies between British Burma and French Indo-China. Its integrity is guaranteed by France and Great Britain under mutual agreement. The form of government is an absolute monarchy, with an Executive Council of ministers. The reigning king is Chao Fa Maha Vajiravudh.

CONTROL.

Radiotelegraphy is organised in Siam under supervision of the Minister of Marine, but it is now controlled by the Ministry of Communications in so far as the public is concerned. The first stations erected were those at Saladeng in Bangkok, and at Songkhla*; both these land stations are directly controlled by Government.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Eng. Capt. Phra Vidyu Duralikhit	Head and Chief Engineer of Radiotelegraphic Department	Wireless Station, Bangkok.
Eng. Lieut.-Commander Luang Jam Aggikich	Assistant Engineer.	Wireless Station, Bangkok.

ORGANISATION.

There are experimental, amateur, and instructional stations at Saladeng. There are also ship stations on Government vessels.

ADMINISTRATION.

The law and regulations under which radiotelegraphy is administered in Siam will be found below.

A—Radiotelegraph Law, B. E. 2457 (1914).

B—Notice concerning the opening of Radiotelegraphy for Public Service, B. E. 2462 (1919).

C—Ministerial Regulations relating to the use of Radiotelegraphy, B. E. 2462 (1919).

D—Radiotelegraph Amendment Act, August 4th, 1921.

RADIOTELEGRAPH LAW.

A This Law may be cited as "The Radiotelegraph Law, B.E. 2457" (1914).

2. It shall come into force from the date of its publication in the Government Gazette.

COAST AND LAND STATIONS.

3. The right to establish and work radio-stations for telegraphic and telephonic pur-

poses on Siamese soil and on board ships permanently anchored in Siamese territorial waters is an exclusive privilege of the Government.

This privilege shall be reserved to the Department of Posts and Telegraphs in the Ministry of Communications.

4. The Army and Navy may establish and work independently radiotelegraph stations or field apparatus subject to such conditions

* Sometimes spelt "Singora."

as may be from time to time sanctioned in writing by the Minister of War or Marine.

Any station established under this section may be opened to public correspondence only under special arrangement with the Department of Posts and Telegraphs.

SHIP STATIONS.

5. No merchant ship under the Siamese flag shall establish or work any radiotelegraph or telephone apparatus without a licence from the Minister of Communications.

The Minister of Communications shall not grant such licence until he has been satisfied that the apparatus can work in accordance with the provisions of the International Radiotelegraph Convention of London, 5th July, 1912, and will be handled by qualified operators.

Such licence shall be for such time and subject to such conditions as the Minister of Communications may deem good.

6. No ship, whether under the Siamese or a foreign flag, excepting ships of war, is allowed while in Siamese territorial waters to send a message by means of her radiotelegraph apparatus when and where such message can be forwarded by the Government system, either with or without wires, except for the purpose of transmitting messages to or from a ship in distress.

SECRECY.

7. No person or persons engaged in or having knowledge of the operation of any radio-station shall disclose the contents of any message transmitted or received by such station for the purpose of transmission, except to the person to whom the same may be directed or his authorised agent, or to another station employed to forward such message to its destination or in obedience to the direction of a Court of competent jurisdiction.

PENALTIES.

8. Whoever establishes or works any apparatus contrary to the provision of Sections 3 and 6, or in excess of the conditions laid down under Section 4 of this Law, shall be punished with imprisonment not exceeding six months or fine not exceeding five hundred ticals or both.

The captain or master of a ship, and the person directly responsible for the offence, if any, shall both be liable to punishment for every infringement of the provisions of Section 6.

9. Any person infringing Section 5 of this law shall be punished with fine not exceeding one hundred ticals.

10. Upon the conviction of any person of an offence under the foregoing sections, the Court may order the forfeiture of any apparatus used for the commission of such offence.

11. Any person injuring apparatus or committing any act of mischief to a radiotelegraph station lawfully established, or doing anything to prevent or intended to prevent the transmission or delivery of any radiotelegraph message by any such station, shall be guilty of an offence under Section 196 of the Penal Code.

12. Whoever commits any offence against Section 7 of this Law shall be punished under Section 279 to 281 of the Penal Code.

EXECUTION.

13. The Minister of Communications shall have charge and control of the execution of this Law.

It shall be lawful for him to frame regulations and to fix the scale of fees for land, coast, and ship charges in the transmission of messages by radiotelegraphy or telephony, as well as for licences under Section 5.

It shall also be lawful for him to frame regulations about the qualifications required from operators.

All such regulations shall be in accordance with the detailed Service Regulations appended to the International Radiotelegraph Convention.

Such regulations, on being sanctioned by His Majesty and published in the Government Gazette, shall be deemed to be part of this Law.

Given on the 24th day of April, B.E., 2457 (1914), being the 1,261st day of the Present Reign.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas His Majesty's Government has always reserved to itself the exclusive right to establish and work means of telegraphic and telephonic communications throughout Siam;

And whereas apparatus for wireless telegraphy has now been devised practicable for use by land and sea;

And whereas it is desirable that ships under the Siamese flag, more especially passenger carriers, should be equipped with such apparatus, worked under proper regulations, for the greater safety of life at sea;

And whereas the regulations necessary to insure the proper and efficient working of wireless telegraphic stations must conform in all respects with the provisions of the International Radiotelegraph Convention of London, 1912, to which His Majesty's Government has been a party;

Therefore His Majesty has been pleased to enact the following law:—

NOTICE CONCERNING THE OPENING OF RADIOTELEGRAPHY FOR PUBLIC SERVICE.

Dated 22nd May, 1919.

B In view of the progress made in commerce and trade in this country, it is considered that the use of Radiotelegraphy which was originally established by the Royal Government for its own use should be extended to general public.

The Ministry of Communications having submitted these facts before His Majesty the King, has now obtained the Royal Permission that the Naval Radiotelegraphic stations in Bangkok and at Singora (Songkhla) should be open to public use from the 1st June, 1919.

The public radiotelegraphic service will be under the management of the telegraph officials of the Post and Telegraph Department, who will receive and despatch radiotelegraphic telegrams in a similar manner to the despatch of other telegrams in the Kingdom.

Senders of radiotelegraphic messages should write clearly the words "Wireless Telegraph" on the upper left-hand corner of the form supplied, before the names of the persons for whom the messages are destined.

(Sd.) 1st Grand Councillor,
Chao Phya Wongsu Nuprabadh,
Minister of Communications.

MINISTERIAL REGULATIONS

FOR THE LICENSING OF RADIOTELEGRAPHY UPON SHIPS, THE ISSUING OF CERTIFICATES OF COMPETENCY TO RADIOTELEGRAPH OPERATORS, THE FIXING OF FEES FOR SUCH LICENCES AND CERTIFICATES AND THE FIXING OF FEES FOR LAND, COAST AND SHIP CHARGES IN THE TRANSMISSION OF MESSAGES BY RADIOTELEGRAPHY.

C Whereas under Sections 5 and 13 of the Radiotelegraph Law, B.E. 2457, the Minister of Communications is empowered to licence the establishment and working of radiotelegraph apparatus upon merchant

ships under the Siamese Flag, to frame regulations about qualifications required from operators and to fix the scale of fees for land, coast and ship charges in the transmission of messages by radiotelegraphy, such Regulations, on being approved by His Majesty and published in the Government Gazette to be deemed to be part of the Law.

It has now pleased His Majesty the King to authorise the Minister of Communications to issue the following Ministerial Regulations:—

1. The operation of radiotelegraph stations upon any merchant ship under the Siamese Flag must conform to the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended to the said International Radiotelegraph Convention, the Radiotelegraph Law, B.E. 2457 and any amendments and alterations which may be made therein, and the regulations from time to time issued by the Minister of Communications under the authority of said Radiotelegraph Law, B.E. 2457.

2. No person shall work the radiotelegraph upon any merchant ship within Siamese territorial waters in such a way as to interrupt or interfere with

(a) Naval or military signalling.

(b) The transmission of messages between other radiotelegraph stations lawfully established.

3. Before the installation of any radiotelegraph apparatus upon any merchant vessel under the Siamese Flag, an application shall first be filed with the Minister of Communications, according to Form A of Schedule I, attached hereto. If the Minister of Communications is satisfied that the apparatus described in said application will, when installed, be capable of working in accordance with the requirements of Section 4 (a) of these Regulations, an installation licence will be issued according to Form B. of said Schedule I. When the installation is completed, the applicant shall notify the Minister of Communications, who thereupon will cause an inspection to be made. If this inspection is satisfactory, the Minister of Communications will issue a ship licence according to Form C, and subject to the conditions therein contained. Such ship licence shall be good until March 31st after its date, but may be renewed within one month immediately after the expiration of the period for which it was issued. Such installation licences and ship licences shall be executed in duplicate, one copy to be retained by the Ministry of Communications and the other given to the licensee.

4. The Minister of Communications shall not grant such ship licence unless he is satisfied that—

(a) the radiotelegraph apparatus can be worked in accordance with the provisions of the International Radiotelegraph Convention of London and the detailed Service Regulations appended thereto, and that,

(b) operators qualified in accordance with the provisions of these Regulations and who are the holders of the certificates provided for herein will be employed to work the same.

5. A separate licence is required for each ship belonging to the same owner.

6. The fee for the issuance of each ship licence shall be 5 Bahts and a fee of the same amount shall be charged for each renewal thereof.

7. No person shall work a radiotelegraph on board any merchant ship under the Siamese Flag unless he holds either a first or second-class certificate of competency granted by the Minister of Communications.

8. The Minister of Communications shall grant certificates of competency in accordance with the conditions contained in the second Schedule to these Regulations.

9. Should a holder of a certificate of competency granted under these rules be proved to the satisfaction of the Minister of Communications wilfully or negligently to have failed to comply with the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457 or the Regulations issued by the Minister of Communications, or any amendments or modifications of any of these or any other Regulations which may be issued from time to time for his guidance, the Minister of Communications may cancel the certificate.

10. The Minister of Communications or any officer authorised by him may require the holder of a certificate of competency to produce the same for cancellation under Regulation 9, and the holder must comply with such requisition.

11. Nothing in these Regulations shall apply to the use of the radiotelegraph for the purpose of making or answering signals of distress.

12. Rates for messages transmitted to or received from ship stations shall be as follows:—

Coast station transmitting or receiving charge for radiotelegrams to or from ships, 20 satangs (0.40 francs) per word with a minimum charge of 2 Bahts (4.00 francs).

Land charges for the receipt or transmission of radiotelegrams over the Inland Telegraph System shall be those provided in the published tariff for inland messages. Land charges shall in addition include the actual expenses of postage or carriage, if the message is to be delivered outside of established telegraph districts.

Charges for relaying messages outside of Siam shall be fixed in accordance with published international tariffs.

These rates may be modified or supplemented and rates fixed for the charges at ship stations by the Minister of Communications.

III.

The ship licence provided for in Regulation 3 shall be in the following form and subject to the following conditions:—

FORM C.

Know all men by these presents that, whereas.....of.....hereafter called the "licensee," is desirous of establishing, maintaining and working on the ship..... belonging to the licensee, radiotelegraphy under Section 5 of the Radiotelegraph Act, B.E. 2457;

And whereas the licensee has agreed and by the acceptance of this licence, does become bound to operate and maintain the radiotelegraph installation for which this licence is granted in accordance with the International Radiotelegraph Convention of London of July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457, and the Regulations thereunder by the Minister of Communications, and any and all amendments and modifications of any of these, which may be made from time to time;

Now the Minister of Communications hereby grants to the licensee during the term or period commencing with the date hereof and terminating on the 31st day of March, B. E. 24....(19), licence and permission;

(1) To establish, maintain and work for the purpose hereinafter mentioned upon the shipbut subject in all respects to the provisions of said International Radiotelegraph

Convention of London, July 5th, 1912, to the Service Regulations appended thereto, the Radiotelegraph Law of B.E. 2457, and the Regulations issued by the Minister of Communications, and all amendments and modifications of any of these, apparatus for radiotelegraphy known as the.....system of radiotelegraphy.

(2) To transmit and receive messages by means of the licensed apparatus between the said ship and coast stations and other ship stations;

(3) To receive money or other valuable consideration for or in respect to the use of the

licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus, according to the schedule of charges fixed in the Regulations or by the Minister of Communications.

And it is hereby declared that the said licence and permission is granted upon and subject to the following further conditions and provisions :—

(1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of any messages except those authorised by this licence.

SCHEDULE I.

Conditions and Forms of application for Licence to install Radiotelegraph Apparatus on ships, Installation Licence, and Ship Licence.

I.

Application for installation licences shall be made according to the following form :—

FORM A.

I, of the owner of the ship do hereby make application for permission to install upon said ship apparatus for radiotelegraphy according to the following specification :—

SPECIFICATION.

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Appar'tus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments.		
						Current	Voltage	
1	2	3	4	5	6	7	8	9

The above described apparatus will be installed in.....months.
Signed.....

II.

Licence for installation of Radiotelegraph Apparatus upon ships shall be according to the following form :—

FORM B.

Licence for installing Radiotelegraph Apparatus.

Whereas.....of.....has filed with the Ministry of Communications his application dated.....for the installation of radiotelegraph apparatus upon the ship.....

Now the Minister of Communications does hereby licence and permit the installation upon the said ship within the period of.....months from date of radiotelegraph application in accordance with the following specification :

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Appar'tus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments.		
						Current	Voltage	
1	2	3	4	5	6	7	8	9

This licence and permission does not permit the licensee to operate said apparatus above described until after its inspection when installed and the issuance of a ship licence.
Signed.....
Minister of Communications.

(2) (a) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval or Military signalling or with any radiotelegraph station lawfully established.

(b) If at any time it becomes apparent that the working of the licensed apparatus upon said ship is inconsistent with the free use of naval or military signalling the licensee shall when required to do so by the Minister of Communications close said station upon said ship.

(3) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Minister of Communications from time to time for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station.

(4) The licensee shall at all times indemnify His Majesty's Government, the Minister of Communications and the Department of Posts and Telegraphs against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any damage arising from any act licensed or permitted by these presents.

(5) Subject to the provisions of this licence, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or precedence whether as regards rates of charge, order of transmission or otherwise, except that preference shall be given to messages transmitted on behalf of His Majesty or of His Majesty's Government.

(6) The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus, or any other means in the power of the licensee.

(7) The licensed apparatus shall be worked only by a person holding a certificate of competency issued by the Minister of Communications.

(8) The licensee shall not divulge to any person other than properly authorised officials of His Majesty's Government or make any use whatever of any message coming to the knowledge of the licensee through naval or military signalling.

(9) The licensee shall keep such accounts records and registers of all messages transmitted by means of the licensed apparatus as the Minister of Communications may from time to time require and such accounts, records and registers shall be open to the inspection of the Minister of Communications or his duly authorised representative at all reasonable times.

(10) The Minister of Communications or his duly authorised representative may at all reasonable times enter upon said ship for the purpose of inspecting and may inspect any apparatus fixed or being in such ship for the purpose of sending and receiving messages by radiotelegraphy, and the method of working such apparatus.

(11) The Minister of Communications may at any time by notice in writing but without assigning any reason revoke and determine this licence and thereupon this licence shall determine and become absolutely void.

(12) Any notice, request or consent (whether required to be in writing or not) to be given by or on behalf of His Majesty's Government or by the Minister of Communications or the Director-General of the Post and Telegraph Department, may be served by sending the same in a letter addressed to the licensee at the office for the time being of the licensee, or by delivery to the master of the ship upon which the licensed apparatus is installed and any notice to be given by the licensee under these presents may be served by sending the same in registered letter addressed to the Minister of Communications.

Signed and delivered by.....
Minister of Communications.

SCHEDULE II.

CONDITIONS AND FORMS FOR THE GRANTING OF CERTIFICATES OF COMPETENCY.

(1) Certificates of competency as to radiotelegraph operators on board merchant ships under the Siamese Flag shall be granted by the Minister of Communications, subject to an examination and shall be in accordance with Form B appended hereto. Such certificates shall indicate the system or systems of radiotelegraphy in which the examination was conducted, and shall certify that the holder:

(a) In the case of first-class certificates is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of not less than 20 words per minute (five letters being counted as one word); or

(b) In the case of second-class certificates is able to send and receive by sound, messages in plain language in the International Morse Code at a rate of from 12 to 19 words per minute (five letters being counted as one word); and

(c) Is able to adjust the apparatus ordinarily used in some well-known system of radiotelegraphy so as to suit the varying conditions of working without using excessive transmitting power; and

(d) Has an efficient working knowledge of the regulations applicable to the exchange of the radiotelegraphic traffic.

(2) Candidates for examination shall fill up an application according to Form A attached hereto, and submit the same to the Minister of Communications at Bangkok.

(3) Upon being notified that he has successfully passed the examination each candidate shall supply two photographs of himself, one of which will be attached to the certificate of competency, and the other to the duplicate of the certificate which is retained by the Minister of Communications. These photographs will be signed by the candidates and stamped by the issuing officers in such a way as to prevent substitution.

(4) A fee of 10 Bahts will be charged for each examination and an additional fee of 10 Bahts for the certificate issued to a successful applicant.

(5) Each certificate shall be good for five years and may be renewed at the expiration of that period for a like period of five years. Such renewal may be without re-examination if the applicant has been engaged in the actual transmission and receipt of radiotelegrams during at least three of the preceding five years. Otherwise an examination will be required. The fees for renewal examinations and the issuance of renewal certificates are the same as for the original examination and issuance.

(6) If the candidate satisfactorily passes the examination, he shall make a declaration that he will observe the secrecy of radiotelegrams which come to his knowledge in the course of duty.

FORM A.

Application for examination for a.....
class certificate of competency as a radio-
telegrapher.

1. Name
2. Residence
3. Date and Place of Birth
4. Nationality
5. System of radiotelegraph in which
applicant wishes to be examined

The undersigned applicant for examination for a certificate of competency as a radiotelegrapher agrees that, if successful, he will observe all requirements, so far as they may apply to him, of the International Radio-Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B.E. 2457, the Regulations used in pursuance thereof, and all amendments and modifications of any of these, which may be issued from time to time.

(Signature).....

FORM B.

....CLASS CERTIFICATE OF COMPETENCY.

Whereas.....having been examined as to his competency as a radiotelegrapher, according to the Regulations in such case made and provided and said examination having been successfully passed

It is hereby certified that.....is able to send and receive by sound messages in plain language in the International Morse Code at the rate of.....words per minute (five letters being counted as one word) and is able to adjust the apparatus ordinarily used in the.....system of radiotelegraphy so as to suit varying conditions of working, without using excessive transmitting power and has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

Accordingly this.....class certificate of competency has been issued to the said.....
.....who by accepting it agrees to be

bound, so far as they may apply to him, by all provisions of the International Radiotelegraphic Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraphic Law B.E. 2457, and the Regulations issued under the authority thereof, and any amendments and modifications of any of these which may be issued from time to time.

Signed and delivered by.....
Minister of Communications.

BACK.

Name

Residence

Date and Place of Birth.....

Nationality.....

I do hereby declare that I will observe the secrecy of radiotelegrams which come to my knowledge in the course of duty.

(Photograph).

THE RADIOTELEGRAPH AMENDMENT ACT.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas the authority conferred upon the Minister of Communications by virtue of Article 13 of the Radiotelegraph Act B.E. 2457 is not sufficient to execute and control the Radiotelegraph service.

Therefore His Majesty has been pleased to further amend the Radiotelegraph Act B.E. 2457 as follows:—

(1) This Act shall be called the Radiotelegraph Amendment Act, 2464.

(2) It shall come into force from the 4th day of August, 1921.

(3) In Chapter VI Article 13 after paragraph 3 of the Radiotelegraph Act B.E. 2457, the following paragraph shall be inserted, namely:

It shall also be lawful for him, whenever he deems expedient, to issue notifications granting temporary permission to ships to send and receive messages by means of their wireless apparatus while in Siamese territorial waters. Given on the 4th day of August, 1921, being the twelfth year of the Present Reign.

SIERRA LEONE

(See Maps 24 and 26.)

THE administration of the Colony of Sierra Leone is conducted by a Governor and Commander-in-Chief assisted by Executive and Legislative Councils. The same officials also administer the "Protectorate" a term which applies to the territories not being portions of the Colony of Sierra Leone lying between 6° and 10° north latitude and 10° and 14° of west longitude.

CONTROL.

A wireless telegraphy station is installed at Freetown, and is owned and controlled by the African Direct Telegraph Company.

The regulation of wireless telegraphy rests solely in the hands of the Government. There are no wireless clubs or societies.

ADMINISTRATION.

The Sierra Leone wireless laws and regulations were first formulated in the Decree of 1903, and the Schedule founded thereon. In 1912 this Decree and the regulations in the Schedule were amended by Ordinance No. 19 with

the Schedule which was thereto attached. In the following year (1913) these were in their turn replaced by Ordinance No. 11 with its accompanying Schedule, both of which we print below. A set of Regulations issued on July 16th, 1917, has been superseded by an additional set issued on May 12th, 1919, which will be found below.

The list of reprints included here covers:—

A—Ordinance No. 11 of 1913.

B—Schedule dated May 23rd, 1913.

C—Regulation No. 1 of 1919.

ORDINANCE No. 11 OF 1913.

TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

A Be it enacted by the Governor of the Colony of Sierra Leone, with the advice and consent of the Legislative Council thereof as follows:—

1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. *Definition of "Wireless Telegraphy."*—In this Ordinance, "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. *Licence for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony, except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus aboard ships to be worked in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) *Schedule.*—The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established

without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a licence in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance, he may grant a search warrant to any superior Officer of Police named in the warrant, and a warrant so granted shall authorise the Officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to be used or intended to be used for wireless telegraphy therein.

7. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Repeal.* No. 22 of 1903, No. 19 of 1912.—The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy Amendment Ordinance 1912, are hereby repealed.

SCHEDULE—SECTION 5 (2).

REGULATIONS.

B 1. All apparatus for Wireless Telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations, "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Passed in the Legislative Council this twenty-third day of May in the year of our Lord, one thousand nine hundred and thirteen.

REGULATIONS (No. I OF 1919)

MADE UNDER SUB-SECTION (1) OF SECTION 5 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913 (No. II OF 1913).

Whereas by sub-section (1) of section 5 of the Wireless Telegraphy Ordinance, 1913 (No. II of 1913), it is provided that the Governor may from time to time make regulations for carrying into effect the purposes of the Ordinance:

And whereas by sub-section (2) of section 5 it is provided that the regulations made and passed by the Legislative Council, 23rd day of May, 1913, shall have effect except in so far as they shall be amended or rescinded by regulations made under the authority of the section:

And whereas by regulations made the 16th day of July, 1917, certain of the above recited regulations were rescinded and other regulations were substituted therefor:

And whereas I am minded to make other provision in lieu of the last above recited regulations:

Now, therefore, under and by virtue of the power and authority in that behalf vested in me it is ordered that the regulations made the 16th day of July, 1917, are hereby rescinded and the following substituted therefor:—

1. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made this 12th day of May, 1919.

SOUTH AFRICA (UNION OF).

(See Maps 25 and 32)

Including: Provinces of Natal, Zululand, Transvaal, Orange Free State and South-West Africa.

CONTROL.

THE administration of radiotelegraphy is in the hands of the Postmaster-General and is not treated as a separate unit.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Major E. A. Sturman, C.B.E.	Postmaster-General	Pretoria
Lt.-Col. N. Harrison, C.M.G., D.S.O., M.I.E.E.	Secretary to the General Post Office	Pretoria.

There are no privately owned stations, but licences are issued for private wireless telegraph stations.

The latest available statistics are as follows:—

Land stations for public service to ships	4
Ship stations on privately owned vessels	5
Ship stations on railway owned vessels	3

An agreement has been entered into between the Government and the Marconi Company for the erection, under licence, of a powerful radio station capable of communicating with England. The terms of the licence are for either the taking over by the Government or the renewal of the licence every ten years.

The station when completed will be about twice as powerful as that of Saint Assise, near Paris.

ADMINISTRATION.

The only statutory regulation on radiotelegraphy within the Union is that contained in the preamble to the Post Office Act, and section 80 *ibid.*, both of which will be found below.

There is no Union Act compelling ships trading in South African waters to be fitted with radiotelegraphic apparatus.

A—Statutory Regulation (Preamble to P.O. Act, 1911).

B—Section 80 of Post Office Act, 1911.

C—Licence to establish and work a Private Wireless Telegraph Station.

D—Regulation relating to Broadcasting and Experimental Stations.

POST OFFICE ADMINISTRATION AND SHIPPING COMBINATION DISCOURAGEMENT ACT, 1911.

CHAPERT V.—SECTION I.

A In this Act, unless inconsistent with the context, "telegraph" shall include "telephone," and shall mean any system or means of conveying signs, signals, sounds, or communications, by the agency of electricity, magnetism, electro-magnetism, or by any agency of a like nature, whether with or without the aid of wires, and shall include the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of that system.

"Telegraph line" shall include any apparatus, instrument, pole, mast, standard, wire, pipe, tunnel, pneumatic or other tube, thing, or means whatever, which is or may be used in connection with or for the purpose of sending, transmitting, conveying, or receiving telegraphic signs, signals, sounds, or communications.

1. The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purposes of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(b) The Postmaster-General may construct, maintain, or lease telegraph lines for private use or may, by licence, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

POST OFFICE ADMINISTRATION ACT, 1911.

B 80. (1) The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(a) The owners of any system of railways may maintain and work for the purpose of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law: and

(b) The Postmaster-General may construct, maintain or lease telegraph lines for private use or may, by licence, authorise any person to construct, maintain, and work private

telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

(2) No telegraph line shall be used for the purpose of transmitting or delivering telegrams for the public except by the authority of the Postmaster-General and upon such terms and conditions as he may prescribe, and the department shall have the right, by means of its officers, of inspecting all offices which are authorised to accept, transmit, or deliver public telegrams.

UNION OF SOUTH AFRICA.

DEPARTMENT OF POSTS AND TELEGRAPHS.

Licence to Establish and Work a Private Wireless Telegraph Station.

C Under the provisions of section 80 of the Post Office and Shipping Combinations Discouragement Act, 1911, a licence is hereby issued to

to establish and work apparatus for wireless telegraphy at

provided such apparatus shall be of the character specified in the schedule hereto.

The licensed apparatus shall at all times be under the control of the licensee and no other person shall be allowed to transmit signals by means of the licensed apparatus.

No signals shall be transmitted other than such as are necessary to test the licensed apparatus or to aid research in wireless telegraphy by the licensee.

The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established within the Union or the territorial waters thereof.

The licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General of the Union of South Africa and shall at any time cease to work or shall completely dismantle the licensed apparatus upon notice so to do in writing from the Postmaster-General.

The licensed apparatus shall not without the consent in writing of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

The licensee shall at all times indemnify the Postmaster-General against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

The licensee shall not divulge to any person (other than properly authorised officials of the Government of the Union of South Africa or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon the premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting

and may inspect any telegraphic instruments and apparatus fixed or being in such places and the working and user of such apparatus and telegraphic instruments respectively.

All apparatus used by the licensee shall be so placed and used as not to interfere with the efficient or convenient maintenance, working or user of any telegraph line of the Postmaster-General which may from time to time exist.

In case any telegraphic line of the Postmaster-General shall be damaged or the efficient working or user thereof shall be interfered with and the Engineer-in-Chief for the time being of the Department of Posts and Telegraphs shall certify in writing under his hand that such damage or interference has been caused by any apparatus used by the licensee or by anything done by or on behalf of the licensee in relation thereto the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said Engineer-in-Chief shall certify that such addition or substitution is reasonably required.

For the purpose of this licence the expression "telegraph line" has the same meaning as in the Post Office Administration and Shipping Combinations Discouragement Act of 1911.

Except with the consent in writing of the Postmaster-General the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefit of all or any of the licences, powers, or authorities hereby granted.

If and whenever an emergency shall have arisen in which it is expedient for the public service that the Government of the Union of South Africa shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Postmaster-General or the Secretary for Defence by warrant under his hand to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the said Postmaster-General or Secretary for Defence may enter upon the premises of the licensee and take possession thereof and use the same as aforesaid.

The Postmaster-General may at any time at his absolute discretion give notice in writing to determine this licence hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

Nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General.

Any notice (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of the Secretary or any one of the Assistant Secretaries for the time being of the Department of Posts and Telegraphs, and may be served by sending the same in a registered letter addressed to the licensee at the usual or the last known residence or business of the licensee, and any

notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office, Pretoria.

The licensee shall pay to the Postmaster-General in respect of this licence hereby granted a fee of ten shillings.

Postmaster-General.

Signature of licensee
Dated at this day of 192

Schedule in licence granted to
to establish and work apparatus for reception
of wireless signals.

AERIAL.

Extreme height above ground not to exceed
100 feet.

Total length of aerial, including leading-in
wires:—

(a) 100 feet for single wire aerial.

(b) 140 feet wire where two or more wires
are used, e.g., total length of 70 feet of double
wire.

Schedule in licence granted to
to establish and work apparatus for wireless
telegraphy.

Power to consist of not more than 50 watts.

Wavelength not to exceed 200 metres.

AERIAL.

Extreme height above ground not to exceed
100 feet.

Total length of aerial, including leading-in
wires:—

(a) 100 feet for single wire aerial.

(b) 140 feet wire where two or more wires
are used, e.g., total length of 70 feet of double
wire.

Signals to be exchanged with

REGULATION No. 1308, 3rd August, 1923,
FOR WIRELESS "BROADCASTING" AND AMATEUR
WIRELESS EXPERIMENTING MADE BY THE POST-
MASTER-GENERAL, WITH THE CONCURRENCE OF
THE MINISTER OF POSTS AND TELEGRAPHS, AND
APPROVED OF BY HIS ROYAL HIGHNESS THE
GOVERNOR-GENERAL, IN TERMS OF SUB-SECTION
(4) OF SECTION Three OF ACT No. 10 OF 1911.

PART I.

The Broadcaster.

D 1. Any person may apply to the Postmaster-General for a licence to establish a service of broadcasting wireless telephony. The Postmaster-General may, in his discretion, issue a licence on such terms and subject to such conditions as he may decide. For the purpose of the following regulations the term "Broadcaster" means any person who has been granted such a licence by the Postmaster-General.

2. The broadcaster shall establish, at his own expense, as soon after his licence is granted as possible, a broadcasting station with machinery of the latest approved type, powerful enough to transmit easily over a distance to be specified in the licence. No other broadcasting licence shall be issued within such distance during the currency of such licence.

3. The broadcaster shall comply with such conditions not in conflict with these regulations as the Postmaster-General may from time to time communicate to him.

4. The licence shall continue in force for a period of five years, and at the end of the fourth year after its issue the broadcaster shall intimate in writing to the Postmaster-General whether he intends to apply for a renewal of the licence. Upon application made not less than three

months before the expiry of the licence the Postmaster-General may grant a renewal of it for such period and on such terms and conditions as he may decide, or he may, in his discretion, refuse any such application for renewal.

5. The broadcaster shall carry out a regular service lasting in the total for a period prescribed in the licence, consisting of music, entertainment, instruction, public announcements, or other matter which may be approved by the Postmaster-General.

6. The broadcaster shall, at the request of the Postmaster-General, broadcast matter for public purposes, in addition to the ordinary programme, free of charge, for a total period not exceeding three hours in any week.

7. The broadcaster shall have the right to make contracts with listeners, subject to the maximum payments hereinafter specified, provided that contracts of different lengths may be made with listeners at different distances from the broadcasting station. Such contracts shall be on a form approved of by the Postmaster-General.

8. The broadcaster shall have the right to hire out receiving sets.

9. The broadcaster shall have the right to make contracts with advertisers to disseminate advertising matter, and make charges therefor, provided that advertisements shall not be broadcasted for more than ten per cent. of the total daily broadcasting time, or more than once per hour, or for more than six minutes continuously in any hour without the written permission of the Postmaster-General.

10. The broadcaster shall keep proper books of accounts concerning all capital operating and maintenance expenditure of the broadcasting system showing the net profits after allowing for interest on capital expended, sinking fund, and depreciation of the plant, taking into account obsolescence. Such books shall be open for inspection by any officer authorised by the Postmaster-General at any reasonable time.

11. The broadcaster shall not broadcast any news but purely local news or information in the nature of local news, except such as is referred to in regulation No. 6, unless obtained from or authorised under agreement with the publisher of a newspaper or newsagency.

PART 2.

The Listener.

12. For the purpose of these regulations, the "Listener" is any person located within the specified distance of a Broadcasting Station who has obtained from the Postmaster-General a licence to install a receiving set.

13. A person who desires to become a listener may make application to the broadcaster for a contract, subject to payment to the broadcaster of charges per receiving set not exceeding the following, to be paid annually in advance:—

For service to—

Private residences	£2 0 0
Boarding establishments	3 0 0
Cafés, restaurants, or hotels not licensed for sale of liquor ..	4 0 0
Hotels and other premises licensed for the sale of liquor ..	6 0 0
For other premises at such charges as the broadcaster, with the approval of the Postmaster-General, may determine.	

The broadcaster shall not be entitled to decline to enter into such a contract with any one unless the Postmaster-General has signified his approval.

14. The application for a contract shall specify the type of receiving apparatus the listener desires to use.

15. Contracts for a period exceeding one year, but not exceeding the currency of the broadcaster's licence may be entered into on payment by the listener of a reduced charge.

16. The listener having entered into a contract with the broadcaster shall be entitled to purchase an approved receiving set, the specification for which shall be issued by the broadcaster. This may be obtained from any seller if it complies with the specification.

17. No receiving set shall be used unless there has previously been obtained from the Postmaster-General a licence for the use thereof. Such licence shall be obtained upon written application to the Postmaster-General setting forth the particulars of the said contract and the type of the receiving set, and upon payment of the sum of 5s. A licence so issued by the Postmaster-General shall be subject to such conditions as he may deem fit, and shall be available for twelve months from the date of issue, but may at the discretion of the Postmaster-General be renewed on payment of the sum of 5s.

18. The listener shall at the end of the period of any licence either renew the licence within fourteen days or immediately dismantle his apparatus and give notice in writing thereof to the Postmaster-General.

PART 3.

Amateur Wireless Experimenters.

19. No person shall be entitled to experiment in wireless communications within the distance specified in the licence of any broadcaster without complying with the regulations in this part.

20. Any person, being a British subject, who wishes to experiment in wireless communications within the said distance (hereinafter called an "experimenter") may enter into a contract with a broadcaster and pay him such charges, not exceeding one-third of the ordinary charge made to listeners, as the broadcaster may demand. Such contracts shall be on a form approved by the Postmaster-General.

21. An experimenter desiring to make use of any apparatus for the receiving of wireless communications shall make application to the Postmaster-General for a receiving licence, and shall, when making such application, produce to the satisfaction of the Postmaster-General evidence that he is a *bona fide* student and experimenter in the science of wireless communication. The Postmaster-General may issue such a licence for one year on payment of a fee of 5s.

22. The apparatus for receiving placed in use by an experimenter must be of such a kind that it will not cause waves to be emitted by resonance or otherwise which may interfere in any way with any listener.

23. An experimenter shall not be entitled to transmit wireless messages or waves of any kind whatsoever unless he obtains a transmitting licence under regulations No. 24.

24. An experimenter may, on complying with the regulations in this part, obtain from the Postmaster-General an amateur transmitting licence for one year, subject to the following conditions, and to payment of a fee of 5s. :—

(a) Such licences shall be limited to such a number in any area as the Postmaster-General may decide.

(b) The periods during which the experimenter shall be allowed to operate shall not be more than two per week to be specified in the licence.

(c) The power and wavelengths of the transmission and any other technical conditions shall be laid down in the licence.

(d) The aerial used by any experimenter for transmission shall be:—

(r) Not greater than the following maximum dimensions:—

With a single wire:

Height above ground 40 ft.

Length 60 „

Total length of wire 100 „

With a double wire:

Height above ground 40 „

Length of each wire 70 „

(that is, a total length of wire of 140 ft.)

(2) In such a position that it is easily seen from a public roadway.

(e) No charge may be made by the experimenter for the dissemination of matter of any kind whatsoever.

25. An experimenter may apply for a renewal of his licence before the expiration of the current period, and such renewal for a further period of twelve months may be granted by the Postmaster-General at his discretion and on payment of a fee of 5s. If the experimenter fails to apply for renewal, or if the Postmaster-General declines to renew his licence, the experimenter shall immediately dismantle his wireless apparatus.

26. An experimenter must give ready access to any premises at any reasonable time to any officer authorised by the Postmaster-General for the purpose of examining the wireless apparatus installed by the experimenter.

GENERAL.

27. The licence of any broadcaster may be withdrawn by the Postmaster-General:

(a) If he fails within a period to be determined by the Postmaster-General to commence a broadcasting service which, in the opinion of the Postmaster-General, is inadequate;

(b) If, in the opinion of the Postmaster-General, an inadequate service is being given at any time; or

(c) If he ceases to give such service for a period of one week; or

(d) If he continues to broadcast any matter or information of any class which the Postmaster-General considers objectionable, and has requested him not to broadcast; or

(e) If in the opinion of the Postmaster-General the broadcaster has failed to carry out his contract with any listener or experimenter; or

(f) If in the opinion of the Postmaster-General the service is being conducted in an improper manner; or

(g) If the broadcaster contravenes any provision of these regulations or any condition imposed thereunder or any term or condition of his licence.

On the withdrawal of a licence the broadcaster shall cease operations forthwith.

28. The licence of any listener or experimenter may be withdrawn by the Postmaster-General if, in his opinion, it is in the public interest to do so, in which case the listener or experimenter shall immediately dismantle his apparatus, and should he fail to do so any person authorised by the Postmaster-General or the broadcaster may do so, and for that purpose may enter any house or premises.

29. Upon the withdrawal of any licence the licensee shall have no claim for a refund of any fee paid to the Postmaster-General or the broadcaster.

30. These regulations are subject to alteration from time to time provided that no alteration shall be made during the currency of a broadcaster's licence to his financial disadvantage without the broadcaster's consent.

SPAIN

(See Maps 2 and 10)

Including : Canary Islands, Fernando Po., and Spanish Morocco.

CONTROL AND ORGANISATION.

RADIOTELEGRAPHY in Spain is a State monopoly, under the control of the Home Office and the Ministry of War and the Navy.

Licences for erecting and working wireless stations by private companies are not granted, except in the case of teaching or meteorological receiving stations. According to the latest statistics the following stations exist:—

Stations open for international public service	2
Meteorological observatories	4
Official seismological stations	4
Educational stations	7
Stations open for public service to ships	8
Stations open for Government traffic only	13
Stations open for private traffic	2

There are also some *experimental* stations.

There is no special form of licence, and the general conditions subject to which these licences are granted can be found in the addition to Article 6 of the Royal Decree of January 24th, 1908, which Article was modified by Royal Decree of July 19th, 1914, also Article 6 of Royal Decree of February 8th, 1917, and Royal Decree of January, 1920,

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address
Excmo. Sr. D. Vicente Pinies y Bayona ..	Home Minister.. ..	General Arrando 21.
Excmo. Sr. D. José Sanchez Guerra	War Minister	Claudio Coello 18.
Excmo. Sr. D. José Rivera y Alvarez de Castro	Navy Minister	Travesía de la Ballesta 7 dpdo.
Illmo. Sr. D. Luis Rodriguez de Viguri	Director - General of Posts and Telegraphs	General Porlier 50.
Sr. D. José Moreno Pineda	Sub-Director of Tele- graphs.	Barquillo 30-pral.
Sr. D. Agustin Boyer	Head of Radio Service	Alcalá 133.

The only company holding permission to work wireless for public service is the "Compañia Nacional de Telegrafia sin Hilos."

In regard to aviation, wireless telegraph and telephone sets have been installed on board six airplanes and several patrol motor boats employed on the aerial line of Barcelona-Palma (Balearic Islands), and ground stations erected for this service at both ends.

Two more stations will be fitted at Alicante and Oran in connection with the air line running through these towns. At Alicante another station has been installed for meteorological service and aviation. The lines of Madrid-Larache and Cantabrico (Postal Aviation) is also to be equipped with several radiotelegraphic stations.

A commission is setting out to study the establishment of various stations on the coast of Spain for Radiogoneometric Service, and is at the present determining the sites of these stations.

For the service of lighthouses two radiotelegraphic-telephonic stations have been installed at Castellon and Columbretes, and tenders have been invited for the equipment of various other lighthouses, amongst which are Cabos Villano and Finisterre.

Madrid-Aranjuez and Barcelona-Prat de Llobregat stations, owned by the Compañia Nacional de Telegrafia sin Hilos, maintain wireless telegraph public services between Spain and Great Britain, Germany, France, Switzerland, Italy, Austria and Hungary.

The Spanish Military authorities have a net of permanent wireless stations situated at Barcelona, Valencia and other places for intercommunication with Carabanchel (Madrid) as central station, communication with the aviation sets is maintained by Seville (Tablada), Cartagena (Alcazares), Madrid (Cuatro Vientos), Granada, etc.

There are also a number of *portable* ground stations for military purposes.

The Spanish Navy exploits several land stations, as Ciudad Lineal (Madrid), Cartagena, Cadiz, Ferrol, Mahon, Barcelona and Valencia, and arrangements have been made to install 6 kW. Valve transmitters at these places besides the existing sets.

As to Broadcasting, a Royal Decree issued on March 1st, 1923, authorises the introduction of this method of wireless communication in Spain and on June 2nd and 8th, two more Decrees were published establishing the basis under which Broadcasting may be carried out and inviting all companies and individuals concerned to forward any suggestion or remarks for consideration before publishing the definite rules and regulations under which Broadcasting will be carried out in Spain.

In meantime the authorities have given permission to a certain number of clubs and individuals for the erection and use of amateur stations, which up to that time were prohibited in Spain.

ADMINISTRATION.

Spain is one of the signatories of the important "Safety of Life at Sea" Convention, and has become a party to all the international agreements

affecting radiotelegraphy. She has, moreover, passed separate laws and regulations framed with the object of establishing and developing this applied science in the home country and in her dependencies.

In the course of 1917 an important Royal Order was published by the Ministry of Marine, enacting that every merchant vessel of 500 tons and over must install wireless telegraphy. The text of this Order will be found below together with the following current rules and regulations.

- A—Law of October 26th, 1907.
- B—General Rules, January 24th, 1908, and July 19th, 1914.
- C—Regulations, January 24th, 1908.
- D—Royal Order of September 4th, 1914.
- E—Royal Decree dated February 20th, 1917.
- F—Royal Order of June 22nd, 1917.
- G—Decree dated October 12th, 1917.
- H—Royal Decree of February 8th, 1917.
- I—Convention of Madrid, dated June 17th, 1918 (as modified on June 4th, 1919).
- J—Royal Decree of January 18th, 1920.

LAW OF OCTOBER 26TH, 1907.

THE GOVERNMENT OF SPAIN IS HEREBY AUTHORISED TO ESTABLISH AND DEVELOP THE WIRELESS, CABLE AND TELEPHONE SERVICES.

A H.M. Don Alfonso XIII, by the grace of God and by the Constitution, makes it known by these presents that Parliament has decreed and he, the King, has given his Royal assent to the following:—

ART. 1.—The Government is hereby authorised to establish and develop the wireless, cable and telephone services—availing itself of the co-operation of national institutions—by means of a Royal Order which will be published within four months from the promulgation of this law.

ART. 2.—The expenses entailed by each service will be covered by the takings of the concession itself. In the case of certain concessions, the proviso is reserved that the establishment may be taken over by the State in whole or part, by Royal Decree, should the so doing be considered as in the national interests.

ART. 3.—Concessions regarding these new services will be granted by public tender and all necessary conditions must be fulfilled in order to safeguard the interests and security of the nation.

It is therefore decreed:

That all tribunals, magistrates, prefects, governors and all persons in authority, whether civil, military or ecclesiastical, whatever their rank and dignity, must obey and see to it that this Law is observed in all its parts.

Given at the Royal Palace on October 26th, 1907.

GENERAL RULES.

PROMULGATED BY ROYAL DECREE AS THE BASIS FOR THE ESTABLISHING OF WIRELESS SERVICE IN SPAIN.

B ART. 1.—The establishing and exploitation of all systems and apparatus available for the so-called "Hertzian telegraphy," "etherial telegraphy," and "radiotelegraphy," and all similar processes already invented or which may be invented in the future, shall be considered as included among the State monopolies regarding all means of electrical communications.

ART. 2.—The establishing and exploitation of the above telegraphic systems shall be controlled by (1) the Minister of the Interior in all

matters appertaining to the general civil applications of the said systems, and (2) by the Ministers of War and Marine when and where those applications are specially connected with national defence and with the army and navy.

ART. 3.—All other official departments requiring a radiotelegraphic service can erect wireless installations by previous agreement with the Minister of the Interior. Such installations will be under the regulations established for the regular wireless service and wireless experiments.

ART. 4.—No experiments with the above-mentioned systems can be instituted in the Peninsula, or in the Balearic and Canary Islands, or in Spain's African possessions, without the authority of the Ministers of War, Marine or Interior, according to the kind of experiment which it may be proposed to carry out. Such experiments and trials shall be carried out under the official inspection of the respective departments responsible, excepting only those of a technical character carried out by the personnel of the Scientific institutions of the State. These shall be independent of the said departments, providing they adhere to the regulations laid down.

ART. 5.—The Minister on whose authority the above installations and experiments are established and effected must give notice thereof to the other Ministers, giving them also full particulars regarding their service and conditions.

ART. 6.—Acting in agreement with the Ministers of War and Marine, in the cases herein aforesaid, and acting independently in all other cases, the Minister of the Interior can authorise the installation of wireless stations, provided that none have been officially installed, when the said installations may have been applied for by individuals, societies, corporations or national institutions, subject to the following rules:—

(1) The applicant shall address himself in the first instance to the Minister of the Interior, stating clearly the place where the installation is to be erected, and supplying a plan of the building, together with the conditions and advantages of the locality.

(2) Such installations and the services they are expected to render shall be subject to the special rules and conditions laid down in each

case, and to the general regulations established by the State for its own installations and wireless service.

(3) The Government shall have the right to close the service under extraordinary circumstances affecting the safety of the State and the maintenance of public order.

(4) The Government shall also have the right to acquire by purchase, whenever it may be considered convenient, and with the previous payment of an indemnity, the wireless installations hereinbefore mentioned and the valuation for such compensation shall take into consideration the actual condition of the material and of the installation itself.

(5) The concessionaire shall let the Minister of the Interior know, in good time, the date on which the station or stations will start working, in order to allow the personnel of the telegraph office the necessary time for their inspection.

(6) The petitioner must not consider himself entitled to proceed with the work of installation until the necessary authorisation has been granted.

The following rules were added by Decree of July 19th, 1914.

(7) If the stations are to be fitted up merely for the reception of messages and for scientific purposes, or to serve as auxiliaries to meteorological observatories, authorisation for the same can be obtained from the Minister of the Interior, provided that the application be made by an Official Institution or by a private individual acting with the support of an Official Department.

(8) These receiving stations must be inspected by the Director of Telegraphs of the locality where they are installed.

(9) The persons appointed to carry out the reception must take an oath before the Civil Governor of the Provinces, to keep secret all information they may gather from the radiotelegraphic messages.

ART. 7.—The ships belonging to the national mercantile marine can install on board wireless stations worked on any of the wireless systems in current use, provided they obtain a special permit to do so from the Minister of Marine, who will grant it in accordance with the conditions established by the International Agreement and Service Regulations adopted in Berlin on November 3rd, 1906.

ART. 8.—Permits to establish wireless installations will not be granted to any private individual, society, or corporation belonging to a foreign nationality.

ART. 9.—Any person or persons exploiting or using clandestinely any system of wireless, or any person or persons attempting to conduct wireless experiments with apparatus available for the purpose, will be prosecuted in conformity with the Penal Code, the general law, the military orders, or the administrative regulations, as the case may be. Prosecution for these offences will be carried out by the authorities entrusted with the administration of the said laws, orders and regulations; and the State will confiscate all material employed for such purposes.

ART. 10.—By agreement between the Ministers of War, Marine and Interior, the wireless stations which may be considered necessary and convenient for commerce, navigation and national defence will be erected on the seaboard of the Iberian Peninsula, on the Balearic and Canary Islands, and in the African possessions of Spain.

These installations will be under the control of the aforesaid three Ministers, as the case may be, both in the matter of supplies and of personnel and offices, and they will form a part of the national telegraphic system.

This linking up of the wireless with the land telegraphic service will be effected by the ministerial department controlling the various wireless installations.

ART. 11.—Authorisation is hereby given for the interchange of messages between ships belonging to the national mercantile marine and those belonging to foreign nations carrying wireless installations of current systems, and also for the interchange of messages between the said ships and the coast stations already established or to be established by the Ministry of the Interior on the sea board of the Peninsula on the Balearic and Canary Islands, and in the Spanish possessions in Africa.

The Minister of the Interior shall determine the date of the inauguration, the extension and the class of service of each station.

ART. 12.—The Government shall have the option of refusing or accepting those wireless systems the details of which have not been made public.

ART. 13.—The State accepts no responsibility for the wireless service. In the cases of errors or of non-delivery of radiotelegrams the procedure followed will be as established in Art. 35 of the Berlin regulations.

ART. 14.—Whatever the object of the installations, the wireless service shall be organised, whenever possible, in such a way as not to disturb other services of the same kind, or class. The ministerial departments interested shall adopt in each case such rules and regulations as may be found necessary, and shall also arrange regulations with other States regarding frontier installations.

ART. 15.—All wireless services, whether public, official, or private, carried on through the intermediary of land, coast and ship stations, shall be subject to the regulations hereunto attached.

ART. 16.—In addition to the rules herein contained, and those of the regulations mentioned in the previous Article, the provisions affecting Radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, must be observed.

ART. 17.—The Director-General of Posts and Telegraphs shall see to the fulfilment of the stipulations made by Art. 13 of the International Agreement and of those made by Art. 37 of the Berlin Regulations, regarding the International Bureau established in Switzerland. The Ministers of War and Marine shall in accordance thereunto furnish the data required, which must be in the possession of the naval and military installations and stations and also data affecting the merchant ship stations, whose installations are authorised by the Minister of Marine.

ART. 18.—Messages received from or transmitted directly to a country or ship registered in a country which is not a signatory of the convention and regulations of Berlin, can only be admitted through the Spanish telegraphic system and through the coast wireless stations after a declaration has been made by the country in question expressing an intention of applying the rules laid down by the said convention, and their regulations regarding the regular routine of the messages and the security of the accounts. In their radiotelegraphic service the coast stations shall give

preference to the service of those countries which have become parties to the international agreements.

Articles 19 to 34 and the additional articles appended thereto deal with wireless installations on fortresses.

REGULATIONS.

GOVERNING THE WORKING OF THE WIRELESS STATIONS IN SPAIN.

GENERAL SERVICE.

C ART. 1.—All persons are allowed to make use of the wireless service, but the Government reserve to themselves the privilege of suspending for an indefinite period, as they may judge convenient, either every class of communication or such communications as belong to some particular class, or communications which affect some special station or stations.

ART. 2.—The following regulations and conditions laid down for the radiotelegraphic service in Spain, besides the provisions affecting radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, shall be applied to all wireless stations, whether public, official or private, on the coast of the Peninsula, the Balearic and Canary Islands, the African possessions of Spain, and to all ships navigating those territorial waters.

ART. 3.—Ship stations shall be free to select their systems of wireless installation; but for coast stations the administration shall adopt the system and equipment judged to be the best available from the point of view of scientific, technical and economic progress.

ART. 4.—All coast wireless stations shall be linked with the general telegraphic system, by means of private lines, in order to secure rapid communications.

ART. 5.—The working of wireless stations of all classes shall be carried out in such a way that, as far as possible, no disturbance may be occasioned to other stations of the same kind.

ORGANISATION OF WIRELESS STATIONS.

ART. 6.—Wireless stations of all kinds must maintain reciprocal communications with the least possible waste of power.

ART. 7.—Wireless stations in Spain shall use the international signals of the Morse Code for the transmission of messages.

ART. 8.—All wireless installations in Spain including both coast and ship stations, open to the public, must carry on an interchange of messages irrespective of their wireless systems.

During the working hours fixed for each coast station the latter must receive the Morse signals and must also have a transmitter so disposed as to be able to reply in the signals of the same code.

ART. 9.—Coast wireless stations must accept and must give *absolute priority* to calls for help from ships in danger. They must, moreover, answer the said calls in the same order of priority and pass them on as urgent messages to the general telegraphic service.

ART. 10.—The administration shall establish three classes of stations—viz., public, official, and private. Those of the first class must have a radius of 600 kilometres and over, those of the second class one of 400 kilometres (there or thereabout), and those of the third class one of 200 kilometres. Exceptions may be made in accordance with practical experience in working.

ART. 11.—First-class stations shall have three wavelengths at their disposal—namely, one

of 300 metres, another of 600 metres, and another which may reach the maximum length, but which must not be less than 1,600 metres. The last two will be used normally. The second and third class stations shall have two wavelengths—namely, one of 300 metres and one of 600; and those of the second class will use normally the 600 metres wavelength, whilst those of the third class will use one of 300 metres, except in the cases referred to in Art. 14 final paragraph.

Coast stations situated near each other may maintain a special service between each other, provided that the distance between them allows of their doing so; but they must give preference to the Maritime Service. In the latter case, and for communications with national vessels on official matters, coast stations of both classes are allowed to use the special wavelengths to which their installations are adapted or adaptable for these services.

ART. 12.—Ships belonging to the Spanish Merchant Service shall use a normal wavelength of 300 metres, but they can alter this to a maximum of 600 metres.

Only in exceptional cases are vessels of small tonnage allowed to use *normal waves* of less than 300 metres.

ART. 13.—The General Post and Telegraph Office shall publish and keep always up to date a Directory showing the coast and ship wireless stations authorised and open to the public; together with the following information:—

(1) Name and geographical position of the coast station; identification signal in the International Code, and the port of register of the ship fitted with wireless.

(2) Call letters. (These must be all different and must be formed by groups of three-letters).

(3) Normal range.

(4) Wireless system adopted.

(5) The class of receiving apparatus whether with automatic call device, etc.

(6) Length of waves used by the station. (The normal wave must appear in italics.)

(7) Class of service rendered by the station.

This covers such items as general communication, restricted communication (*i.e.*, communications with ships, with steamship companies, with ships fitted with apparatus of the same system, etc.); public long-distance communications; communications of a private nature; special communications (*e.g.*, those of an exclusively official character), etc.

(8) Hours of service.

(9) Coast and ship station rates.

The Directory above-mentioned shall also include information regarding wireless stations not open to general public service and the existence of which has been made known to the International Bureau by the Spanish Administration.

ART. 14.—Wireless service in coast stations shall be, whenever possible, of a continuous nature, operating both night and day without interruption.

The Post and Telegraph Office shall fix, in each case, the hours of service of those stations where the service is limited.

Coast stations where the service is not of a continuous nature cannot close for the day without having transmitted all radiotelegrams to ships within their sphere of action and without having first received all the radiotelegrams advised by them. This proviso shall also apply in the case of ships signalling their presence before the closing hour of the station.

ART. 15.—Private corporations cannot install ship stations nor can they work any such station without Governmental authorisation. Permits in these cases will be issued in accordance with the provisions of the Berlin Convention and Regulations, by the Ministry of Marine, and will be communicated by the latter to the General Post and Telegraph Office.

Ship stations duly authorised must fulfil the following conditions:—

First.—The system employed must be a tuned system.

Second.—The speed, both for the reception and transmission of messages, must not under normal circumstances be less than twelve words per minute, allowing five letters to the word.

Third.—The power transmitted to the wireless apparatus must under normal circumstances, not exceed one kilowatt. Nevertheless, greater power can be used if the ship is obliged to communicate over a distance exceeding 300 kilometres from the nearest coast station; or, if by reason of any interference, no communication can be established without increasing the power.

The service of the coast and ship stations shall be attended to by operators having their qualifying certificates issued by the General Post and Telegraph Office. This certificate must state the professional knowledge of the operator in the following matters:—

- (a) Equipment of the apparatus.
- (b) Transmission and reception at a speed of not less than twenty words per minute.
- (c) The knowledge of the regulations regarding interchange of wireless communications.

The qualifying certificate must also state that the Government has notified the operator that it is his duty to treat all communications as confidential.

Steamship companies are allowed to employ their own qualified operators provided they fulfil the conditions hereinbefore mentioned.

THE MAKING-OUT AND PRESENTATION OF MESSAGES.

ART. 16.—For the making-out and presentation of radiotelegrams the provisions of Articles 10, 11 and 33 of the Berlin Conference Regulations, in addition to the rules laid down in the following Articles, shall be observed.

ART. 17.—Radiogram forms must have the words Radiogram Service on the heading.

On the transmission of messages from ship to coast stations no mention will be made of the date and hour of deposit.

On the re-transmission of the telegraph lines the coast stations shall note their own name as that of the station of origin, followed by the name of the ship, and shall register as the hour of transmission the time at which the radio was received by them.

ART. 18.—The instructions for delivery of messages destined for ships at sea must be as complete as possible. The form must be filled up as follows:—

First.—The name of the addressee with additional indications if necessary.

Second.—The ship's name as it appears in the Directory, adding her nationality, and if necessary, as in cases where there are two or more ships of the same name, adding also her identification letters in the International Code.

Third.—The coast station name as it is given in the Directory.

ART. 19.—The following messages will not be admitted:—

- (1) Reply-paid messages.
- (2) Money orders.
- (3) Messages to be paid on delivery.
- (4) Messages demanding acknowledgment of reception.
- (5) Messages to be forwarded.
- (6) Messages at special rates, except those for transmission on the telegraphic section or over-land wires.
- (7) Messages marked "urgent" except on the over-land wired service, and then only with the reservation that the provisions of the international telegraphic regulations must be applied.
- (8) Messages to be forwarded by post or express.

ART. 20.—The messages may be written in plain language or in code in accordance with the interior regulations for ordinary service and with the international conventions on the matter.

ART. 21.—The officials at the stations can ask the senders of wireless messages to prove their identity.

RATES AND EXECUTIVE REGULATIONS.

ART. 22.—In the counting of words in order to apply the rates the officials must follow the provisions of Article 18, 19, and 20 of the International Telegraph Service Regulations as revised in London in 1903.

ART. 23.—In conformity with Article 10 of the Berlin International Convention, the total rate for wireless messages shall include:—

- (1) The rate applicable to the maritime section, namely,
 - (a) the rate in force at the coast station.
 - (b) the rate in force at the ship station.
- (2) The rate established for the overland wired service, national or international, calculated in accordance with the general rules.

ART. 24.—The rate applicable to the maritime section is hereby fixed at 0.75 pesetas per word, of which 0.45 belongs to the coast station and 0.30 to the ship station.

With regard to the international service, in the case of messages to and from foreign ships, these rates shall be payable in francs, on the same basis.

The rate applicable to the overland wired service, national or international, shall be calculated and allocated in accordance with the interior regulations and with the international regulations.

The minimum rate applicable to the maritime section of wireless messages is hereby fixed at 7.50 pesetas, which is the wireless rate for a radiogram of ten words.

ART. 25.—The coast station rate will be charged only once, even if the message goes through several coast stations.

ART. 26.—The whole cost of the radiotelegram must be paid by the sender, and at ship stations a tariff indicating this must be displayed.

ART. 27.—For the purposes of book-keeping the coast station must consider itself as addressee with regard to the messages coming from the telegraphic service on their way to ship stations; and the coast station must consider itself as the original office with regard to the messages coming from ship stations for transference to the telegraphic service.

ART. 28.—Coast and ship station rates shall be calculated in accordance with the number of words computed, and in accordance with Article 23 of these Regulations.

ART. 29.—Merchant ships at sea can interchange messages if they find it convenient. The rates to be charged in such cases shall be laid down by the respective owners and shall not be taken into account by the National Administration.

ART. 30.—Ship stations on Spanish vessels shall send to those chartering them, upon their arrival in port, all documents in connection with and referring to all messages exchanged with coast stations. The charterers shall send such documents monthly to the General Post and Telegraph Office, where it will be kept for a minimum period of twelve months and where liquidation of the accounts must be made in due course.

ART. 31.—The installations on Spanish men-of-war shall use, in their communications with the coast stations open to the public, the wavelengths which—under the terms of the Berlin Regulations—may be agreed upon between the Minister of Marine and the Minister of the Interior for the official service.

Both Spanish and foreign men-of-war can exchange private messages with the coast stations or with merchant ships; but only for the benefit of their crews. In such cases the technical and tariff provisions of these Regulations and those of the Berlin Convention and the Berlin International Regulations for the transmission of public correspondence, must be observed, as in the case of a merchant ship station open to the public. The regulations established to prevent the disturbance of wireless communications must be most carefully adhered to.

ART. 32.—When men-of-war exchange messages (private) with coast stations or with other ship installations they must follow the rules established for the computation of words and the collection of rates. In such cases the ship's purser in the Spanish vessels and the Minister of Marine shall respectively exercise similar functions to those assigned to the administration on board, and to the owner as far as merchant ships are concerned.

In the calculation of coast and ship station rates for private service exchanged with foreign men-of-war, the General Post and Telegraph Office shall come to an understanding with the Administration of the country to which the said men-of-war belong.

ART. 33.—The same provisions shall hold good in the case of a military wireless installation, either permanent or portable, when the said installation utilises the stations established by the Administration for Public Service.

ART. 34.—Should, by some accident, the Submarine Cable Service be substituted for the Wireless Service for the sending of a message, the former shall only receive the rate applicable to a coast station. If communication by wireless is established between two points in Spanish territory otherwise without telegraphic communication, the rates charged shall be those of the Interior Telegraphic Service, and the rules of that service shall apply, except in the cases provided for in Article 19 of these Regulations.

ART. 35.—In the matter of transmission of messages, of the signals to be employed in them, orders of transmission, calls, acknowledgments of receipt, instructions as to the route to be followed by the radiograms, and instruction as to their final destination, the provisions made in Articles 15 to 32, both inclusive, of the Berlin Regulations must be observed.

ART. 36.—In cases when the return of charges made for radiotelegrams has been justly established the provisions of Article 35 of the Berlin Regulations must be observed.

BOOK-KEEPING.

ART. 37.—In matters referring to book-keeping for the international wireless service the provisions of Article 36 of the Berlin Regulations must be observed.

GENERAL RULES.

ART. 38.—Coast stations, previously authorised by the General Post and Telegraph Office shall furnish the authorised agents of Maritime Information Bureau with all such particulars concerning wrecks and disasters at sea as are of any interest to navigators, always provided that the said agents apply for such information.

ART. 39.—Authorised interchange of messages between ship stations on the high seas must be carried out in such way as not to disturb the coast station's service. The latter shall have, as a general rule, the right of priority for Public Service.

ART. 40.—The order of transmission between ship stations on the high seas shall be settled by agreement between themselves.

The re-transmission of messages between ships at sea shall be arranged by agreement between the interested parties.

ART. 41.—The provisions of the International Telegraphic Regulations shall be applied by analogy, to radiotelegraphic communication as far as they are not antagonistic to these Regulations, or the Convention, Additional Agreement, and the International Regulations of the Berlin Conference.

ART. 42.—The provisions of Articles 5, 6 and 9 of these Regulations shall apply to all classes of wireless installations, official and authorised, even if they are not open to Public Service.

Madrid, January 24th, 1908.

Approved by His Majesty the King.
—Maura.

(Seal.)

ROYAL ORDER OF SEPTEMBER 4TH, 1914.

D ART. 1.—According to the Royal Order of January 25th, 1908, the inspection and regulations of the Wireless Telegraph Service on board vessels of the Mercantile Marine are under the supervision of the Minister of the Navy, and by delegation to the Director-General of Fisheries and Merchant Shipping. The installations should fulfil all the requirements of the said Royal Order together with the rules and regulations of the London Radiotelegraph Convention of June, 1913, and the Rules of the Safety of Life at Sea Convention, January, 1914.

Everything affecting the service shall be controlled by the Navigation Department, which shall attend to the following matters:—

(1) The registration of all new installations authorised.

(2) The forwarding of all documents regarding such new installations accompanied by the order for their recognition.

(3) The sending of a report to the Home Office and War Office as to the result obtained from the various installations, together with indications of their characteristics.

To attend to this service the Director of Navigation and Fisheries will nominate a chief or a superintending official, together with five wireless inspectors on the coast, and this staff must have the qualifications as set forth in the Royal Order of May 21st last.

ART. 2.—The distribution of the staff on the coast and in the maritime provinces under each inspector shall be as follows:—

Barcelona.—Maritime provinces of Barcelona, Tarragona, Valencia, Mallorca, and Minorca (the residence of the inspector being at Barcelona).

Cartagena.—Maritime provinces of Alicante, Cartagena, Almeria, and Malaga, Melilla and Ceuta (the residence of the inspector being at Cartagena).

Cadiz.—Maritime provinces of Cadiz, Canary Islands and Huelva (the residence of the inspector being at Cadiz).

Vigo.—Maritime provinces of Vigo, Pontevedra, Villagarcia and Coruña (the residence of the inspector being at Vigo).

Bilbao.—Maritime provinces of Gijón-Santander, Bilbao and S. Sebastián (the residence of the inspector being at Bilbao).

ART. 3.—The wireless inspectors shall be under the orders of the Commandante de Marina of Districts to which they are attached and in the ports of which they will have to make their annual inspection. They will only be allowed to leave their habitual place of residence when, for the convenience of the shipbuilders, they have to inspect a station in any other part of their district.

ART. 4.—The wireless inspectors must attend to the following duties:—

(a) To verify and inspect all new installations concerning which they may have been notified by the Director-General of Navigation and Fisheries that they are ready for public service, and to send in a report of the result of their verification and inspection.

(b) To visit annually the installations of such ships as are registered in the ports belonging to the districts within their jurisdiction, and to issue the necessary certificate according to the London Safety of Life at Sea Convention.

(c) To inspect foreign ship stations on board vessels which take passengers in Spain with the object of verifying that they are in possession of the certificate issued under the Safety of Life at Sea, which certificate must have been issued by the maritime authorities of their respective countries.

(d) To report to the Director-General all remarks or complaints made by the ship-owners, crew or passengers in regard to this service so that the aforesaid Director may take such necessary steps as he may think fit.

(e) To see that all the staff that work the installations are in possession of the Government certificate according to the law of January 24th, 1908, with the object of making sure that all these installations are handled by duly qualified operators.

ART. 5.—For these duties a register book will be given to the wireless inspector in which he shall note the following particulars of each visit:—

- (a) Date and place of inspection.
- (b) Name of the vessel.
- (c) System, radius, wavelengths, etc.
- (d) Names of operators and dates of their certificates.

A copy of this information is to be sent every quarter to the Director-General in order that he can make out a list and maintain a register devoted to all important information and data.

ART. 6.—The naval and marine authorities will do their best to facilitate the work of the inspector, putting at his disposal the *craft* and

personnel required by him for the fulfilment of his duties.

ART. 7.—When it is desired to install a wireless station on board a ship, the builder, the owner, the agent or the captain must ask for permission from the Director-General of Navigation and Fisheries. As soon as the installation is completed the applicant must notify the above authority, stating the port in which he desires the visit to be made, so that the wireless inspector may receive instructions accordingly.

ART. 8.—Wireless installations are subdivided into three classes:—

- (1) Stations with permanent service.
- (2) Stations with limited service.
- (3) Stations with special service.

Class 1 includes all vessels which carry twenty-five or more passengers and which have an average speed of fifteen or more knots. This class includes also ships carrying 200 or more passengers, having a speed of over thirteen knots, and travelling a distance of over 500 miles between two consecutive ports. The latter vessels should carry at least two telegraphists.

To Class 2 belong all the steamers not included in Class 1, provided they are fitted to carry twenty-five passengers or more. During the voyage the ships of this class must have one telegraphist on constant watch during seven hours per day and ten minutes at the beginning of the other hours.

In cases where the vessel is more than 500 miles distant from the nearest coast, the watch must be permanent.

To Class 3 belong all ships which are not included in Classes 1 and 2, and having fifty or more persons on board and carrying less than twenty-five persons or none.

The watch service on these ships must be continuously maintained during a transatlantic voyage or when the ship is over 1,000 miles distant from the coast. In special circumstances, and whenever advisable for the safety of life at sea, ships of every class may be obliged to keep a constant watch.

Vessels belonging to subsidised Government lines are obliged to carry wireless no matter where they sail or what crew they carry.

ART. 9.—The radius of the wireless station shall be a minimum of 100 miles at sea in daytime when communicating with ships under normal conditions and circumstances.

All the stations must be provided with an emergency set, installed on the upper deck, which must be kept in the best condition, having a source independent of the main electric supply and capable of being set in instant working order; this set must be able to work during six hours at least, and must possess a radius of a minimum of eighty miles for ships of the first class and fifty miles for the others.

ART. 10.—When testing the transmission and reception of messages, both installations shall be made to work with a ship at a distance of about 100 miles.

The wavelength and the oscillation current of the aerials must be measured.

When the Director-General thinks if necessary, the curves of resonance will have to be made and the degrees of coupling adjusted. When it is necessary to test the state of the receiving apparatus, the Director may order that one or several of the officers in that service shall make trial tests with the different stations at various distances during the voyage.

ART. 11.—Inspections must be made at the ports of Barcelona, Cartagena, Cadiz, Vigo and Bilbao, which are the places of residence of the wireless inspectors. However, if for the convenience of builders, the inspection should be carried out at some other port, these builders must defray the travelling expenses of the said inspector.

ART. 12.—The radio inspectors shall receive remuneration for all inspections they carry out with regard to wireless installations.

The amount of this remuneration shall be 100 pesetas with an increase of twenty-five pesetas for each auxiliary transmitter which the ship may carry independent of the emergency installation. Such remuneration shall be the same whatever the rank held by the radio inspector.

The annual inspections held for the issue of certificates in accordance with the provisions of the London Safety of Life at Sea Convention shall be made free of charge.

(Signed) RAMON ESTRADA,

Director-General of Navigation and Marine Fisheries.

Madrid, September 4th, 1914.

ROYAL DECREE DATED

FEBRUARY 20TH, 1917.

Inscribed in the Official Record Under No. 49.

E His Majesty the King (whom God save) inspired by the sentiment of humanity, of which the crews of the merchant ships, which in these difficult times with bravery and with risk to their lives maintain our maritime commerce are deserving, has, in accordance with the proposal of the Director-General of Navigation and Sea Fisheries, designed to decree—

1. All merchant ships of 500 tons and upwards which make long sea voyages or long coasting voyages must carry a wireless installation having a minimum range of 100 miles, as laid down under the International Radiotelegraphic Convention.

2. Similarly the said ships will carry one or more lifeboats in proportion to the number of the crew, each fitted with its own motor, or provided with adjustable motors of such a kind as to answer the same purpose.

3. Local directors of navigation shall allow a certain time for each ship to be provided with these things, the shipowners having to certify before the said authorities that they have taken the necessary steps or made definite contracts to obtain them.

ROYAL DECREE DATED

JUNE 22ND, 1917.

F In view of the request made by the "Cia Nacional de Telegrafia sin Hilos," His Majesty the King (whom God guard) has been pleased to order that all the radiotelegraphic stations concerned in the Royal Decree of Feb. 20th last inscribed in the Official Record under No. 49 shall carry emergency installations in accordance with Article 9 of the regulations for the service of installation and inspection of radiotelegraphy on board merchant ships on September 4th, 1914, excepting those installations which have sources of energy independent of that which forms a regular part of the ship's equipment and is fitted on deck.

Madrid, June 22nd, 1917.

ROYAL DECREE DATED

OCTOBER 12TH, 1917.

Issued in the form of a Circular Published in the Official Gazette of the Spanish Ministry of Marine No. 235 of November 19th, 1917.

G In view of the collection of information by this Administration for the fulfilment of the Royal Orders of February 20th, and June 16th last (inserted in the Official Gazette of this Ministry and numbered 29 and 143 respectively) relative to the complete installation of wireless telegraphs on board merchant vessels of 500 tons and upwards, which are engaged in overseas and extended coasting trade, with a minimum range of 100 miles, on the conditions notified in the regulations governing wireless telegraphy.

And in view of the data recently communicated by the companies "A. E. G. Thomson-Houston Iberica" and "Nacional de Telegrafia sin Hilos," the former saying that its resources permit the construction of 25 stations per month and that within one year 300 can be provided, whilst the latter give an assurance that they are able to supply wireless stations with the least possible delay, but not defining the duration of this delay.

In resulting from previous communications from this department that there are 57 stations already fitted and arranged for, and that there remain some 80 to be constructed or fitted.

It resulting, moreover, that this Administration deems a delay of eight months to be sufficient for the "Compania Nacional de Telegrafia sin Hilos" to supply these 80 stations, that company being looked upon as a firm reputed in the business world as of good standing and with resources fully equal to those of the "A. E. G. Thomson-Houston Iberica" and the delay of eight months being the double of that within which the latter undertake to fulfil those engagements.

His Majesty the King (whom God guard) in conformity with the information supplied by the Administration, and in agreement with his Privy Council, has thought it well to dispose that, beyond a delay of eight months from the date of publications of this Royal Order, the sailings of the ships mentioned in his Decree of February 20th of the present year shall be stopped if they fail to be fitted with complete wireless stations in accordance with the existing regulations, and that the Marine authorities in the provisions shall carefully communicate this decision to those who appear in their books as proprietors of the respective ships.

ROYAL DECREE OF

FEBRUARY 8TH, 1917.

H ART. 1.—All civil private wireless stations, whether they be transmitting and receiving stations, receiving alone, or assigned for the use of scientific or auxiliary meteorological observatories, are subject to the inspection of the Government, such inspection being carried out by the Home Office and the General Direction of Posts and Telegraphs.

The inspection shall be carried out by telegraph officials, and its object is to promote public order and interest, and protect the rights of the communication monopoly that belong to the State, in fulfilment of the present disposition on the matter and in strict observance of the concession conditions.

In accordance with the rights granted by contract with the State to the "Compania Nacional de Telegrafia sin Hilos," this company can also perform the inspection of the

above-mentioned wireless stations at her own expense.

The appointment of inspectors by the company shall be countersigned by the Postmaster-General, and when in performance of their duty will be treated as public officials and be granted the same facilities in the exercise of their duties as those given to the Government inspectors stated in Arts. 3 and 4 of this Royal Decree.

The Home Office shall decide all questions which might arise in the carrying out of this private inspection.

ART. 2.—In addition to the inspection work which the Home Office or the Postmaster-General may at any moment judge convenient to carry out a constant inspection service shall be carried out in the said civil radiotelegraphic stations under the Spanish State authorities.

ART. 3.—To carry out the constant inspection service stated in the preceding article, an inspector for each station shall be appointed by the Postmaster-General, who shall superintend the work, and the station shall not be used even for scientific purposes, except under his personal supervision. The inspector shall adopt such measures as he thinks fit to prevent the station being used during his absence.

When the working of a station cannot be attended to by one official alone, the Postmaster-General may assign two or more inspectors, and distribute between them the work of the station as he may judge convenient.

ART. 4.—Access will be allowed to the inspector of the station at any time of the day or of the night without need of permission, request, or notice of any kind.

For this purpose the keys of the place or places in which the apparatus is installed shall be given to the inspector by the owner or licensee of the station, so that no obstacle or delay may prevent his entrance.

ART. 5.—A weekly report of the general working condition of the station, stating the nature of the service, the day, hour, and minutes when they were effected, and any observation the inspector may judge should be specially noted, should be sent by him to the Telegraph Direction.

Immediate notice shall also be given by the inspector to the General Telegraph Direction of any technical or legal anomaly observed in the working of the station, and the orders of the authority shall be transmitted, executed, or caused to be executed by the said inspector.

ART. 6.—All applications for licence to install a radiotelegraphic station must comply with the following conditions, as well as with all others in force at the time :—

(1) The purpose for which the station is to be employed must be clearly expressed.

(2) A plan of the site where the station is to be installed, its communication with the public street or road, and the places where the apparatus are to be mounted in a 2 per cent-scale, and another plan with diagram of connections and details of aerial in a 10 per cent. scale, shall accompany the request for the licence.

(3) A detailed list of the apparatus specifying their nature, trade mark, and manufacture number (if any), must accompany the application.

(4) The name, age, address, and professional title (if in possession of one) of the operator or operators who will work the station must be stated.

The Home Office Minister can grant or refuse the concession of the licence, and can also

modify the technical conditions of the installation before or after the licence has been granted.

ART. 7.—No modification either of the installation or disposition of the station is allowed without authorisation of the Home Office Minister acting on information of the appropriate inspector.

All modifications should be reported to the General Telegraph Direction by the inspector of the station.

ART. 8.—Before a station is opened the proprietor or licensee will deposit a sum of 5,000 pesetas in the general safe of deposits at the disposal of the Postmaster-General, and set aside to cover the pecuniary obligations which the proprietor or licensee might incur.

This sum must be replaced should it diminish or disappear in making good the obligations for which it is set aside.

ART. 9.—The proprietor or licensee must pay all expenses incurred by the final inspection. These expenses comprise a sum which will be fixed by the Postmaster-General, and which must not exceed 2,000 pesetas per annum, to be given to the inspector in monthly payments as a reward for his services, and in payment of all office expenses.

Office accommodation should also be provided for the inspector of the "Compañía Nacional de Telegrafía sin Hilos," should there be one.

Should there be no telegraph office in the place where the station is installed, the proprietor or licensee must provide decent food and lodging for both the official and private inspectors, should there be any.

ART. 10.—The General Direction will classify as major or minor offences any infringements by the proprietor or licensee or any of their staff of this Royal Decree or any other standing orders in this regard.

In all cases the following will be considered as a major offence :—

(1) Not fulfilling the conditions of the licence.

(2) Any modification in the installation or arrangement of the station without due authorisation of the Home Office.

(3) Deliberate obstruction of the inspector with regard to free access to the station under his charge.

(4) The using of the station for any service without the presence of the inspector.

(5) Infringement of the terms of Art. 8 of the Royal Decree.

ART. 11.—Apart from other criminal or civil responsibilities involved in the offences enumerated in the preceding article, the following penalties will be exacted :—

(a) Fine of 100 to 500 pesetas for petty offences.

(b) Fine of 501 to 2,000 pesetas for serious offences, together with loss of the licence and apparatus. The station will be dismantled at the General Direction of Telegraph's will.

The working of the station may be immediately suspended, by the inspector on his discovery of any of the offences enumerated in numbers 1, 2, 3 and 4 of the preceding articles.

ART. 12.—Apart from other criminal responsibilities binding upon the inspector, acts of commission or omission infringing this Royal Decree or any other standing regulations on the matter will be considered as serious offences, and will be punished in accordance with the rules and regulations of the Post and Telegraph Corporation. Should the inspector not belong to the said corporation (*i.e.*, hold

the rank of private inspector), the offence will be punished with the fine of 100 to 2,000 pesetas and disability from continuing in his office, the "Compañía Nacional de Telegrafía sin Hilos" being responsible for the payment of the fine.

ART. 13.—Any illicit station discovered shall be immediately dismantled, the General Direction taking possession of all apparatus. The proprietor and any other persons who may be found guilty of installing or working such a station shall, apart from other criminal responsibilities to which they be liable, be punished with a fine of 2,000 to 5,000 pesetas.

The owner of the building, director of the establishment, society, or corporation in whose premises a clandestine station is installed, and who, as soon as it comes to his knowledge, does not report the fact immediately in the quickest possible way to the General Direction, will incur the same responsibilities.

ART. 14.—Trial for these offences shall be held in public.

An informer shall be entitled to half of the amount of the imposed fine.

ART. 15.—The use of radiotelegraphy granted to official centres for scientific purposes and worked by public officials is not subject to

constant inspection, and is excused the deposit referred to in Article 8. The service will not be suspended, nor the apparatus confiscated, should any infringement be committed by the licensee or staff; but the persons guilty of the offence shall be subject to the criminal or civil responsibilities which may personally affect them. A report will be sent in by the Minister of the Home Office to the Minister under whose supervision the station is administered of the offences committed in order to assure the observance of this Royal Decree, and that these offences should be noted in the personal service records.

ART. 16.—The terms of the Royal Decree do not concern the "Compañía Nacional de Telegrafía sin Hilos" (except those which specifically affect this company), and the inspection of these stations will be subject to the conditions of the contract with the State.

ART. 17.—The authorisation for the working of radiotelegraphic stations granted with priority under the Royal Decree must be carried into effect. The General Direction of Telegraphs will immediately organise the constant inspection service for the stations not comprised in Articles 15 and 16.

TABLE B AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Call Signs.	Name of Station.	Watching Wave. (Note 1)	Normal Transmitting Wave. (Note 2)	Other Waves used only in case of Interference. (Note 3)	General Watching Wave during (Note 1)	
					First Five minutes of the hour.	Last Ten minutes of the hour.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
MILITARY.						
EGA	Almeria ..	900	900	1200.1590.2100	600	—
EGB	Melilla ..	900	900	1200.1590.2100	600	1590†
EGC	Madrid ..	1500	2100	1500.2500.3750	—	—
EGD	Ceuta ..	1500	1590	900.1200.2100	600	1590†
EGE	Barcelona ..	900	900	1200.1590	600	1590†
EGF	Larrache ..	1200	1200	900.1590.2100	600	1590†
EGG	Valencia ..	900	900	1200.1590	600	1590†
EGH	Bilbao ..	900	900	1200.1590	600	1590†
EGI	Mahon ..	900	900	1200.1590	600	1590†
EGJ	Coruña ..	900	900	1200.1590	600	1590†
EGK	Tetuan ..	2100	2100	900.1200.1590	600	—
EGL	Cape Juby ..	900	900	1200.1590	600	—
EGM	Malaga ..	1500	1590	900.1200.2100	600	—
EGN	La Palma ..	900	900	1200.1590	600	—
NAVAL.						
EBW	Le Ferrol ..	900	900	*1200.1590	600	450
EBX	Cartagena ..	900	1200	*1200.1590	600	450
EBY	San Fernando ..	900	1200	*900.1500.2100	600	450
EBZ	Madrid ..	—	—	—	—	—
CLZ	La Caraca ..	450	450	—	—	—
—	Large ships ..	900	900	*1200.1590	600	450
—	Small ships ..	900	450	900	600	450

NOTES.—(1) A station is always to be called on his watching wave (columns 3, 6 and 7).

(2) Normally the answer to the call and the signal to transmit should be made on the normal transmitting wave (column 4).

(3) In case of interference only, one of the waves indicated in column 5 may be used temporarily to avoid such interference.

(*) 1590 metre and 2100 metre wavelengths not to be used except when communicating with EGC, EGD, EGF and EGK.

(†) The watch on 1590 metres will not be kept except when ordered.

TABLE C AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Name of Station.	Call.	Watching Wave.	Transmitting Wave.	Wave to communicate with other Land and Ship Stations.	Remarks.
Aranjuez	EAA	—	3800	—	—
Barcelona	EAB	600	2350	—	—
		(Ship Stations)			
Cádiz	EAC	600	2500	900	Begins Press at 2030 G.M.T.
		(except when working with EAL and EAT)			
Finisterre	EAF	600	600	900	—
Melenara (Las Palmas)	EAL	600	2100	900 (with EAT)	Begins Press at 0300 G.M.T.
		(except when working with EAC and EAT)			
Soller	EAO	600	600	900	—
Cabo de Palos ..	EAP	600	600	900	—
Santander	EAS	600	600	900	—
Tenerife	EAT	600	2100	900 (with EAL)	Begins Press at 0230 G.M.T.
		(except when working with EAC and EAL)			
Vigo	EAV	600	2350	—	Closed temporarily.
Sta. Isabel de Fernando Poo.	EAY	600	600	—	—
Legación de Tánger ..	AB	900	300	—	Calls EAC on 600 and transmits on 300

A term of eight days is granted from the date of publication of this Royal Decree for all private authorised existent stations to send in to the General Direction the information referred to in numbers 2, 3, and 4, of Article 6, and also make the deposit ordered in Article 9. If the term expires before the fulfilment of these obligations, the station will be considered as illicit, and immediate proceedings taken under Article 13, unless the licensee shall present before the expiration of the fixed term a renunciation of his licence to the Minister of the Home Office through the General Direction. He must as a preliminary thereto have dismantled the apparatus.

The same term of eight days is given to those in charge of existing radiotelegraphic stations to hand over to the General Direction the information asked for in numbers 2, 3, and 4 of Article 6. Should the term expire without the fulfilment of these conditions proceedings will be taken according to Article 15.

CONVENTION OF MADRID, DATED JUNE 17TH, 1918, AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919. CONCERNING WAVELENGTHS TO BE USED BY STATIONS UNDER SPANISH CONTROL.

I. The undersigned have held meetings of a semi-official character in the Ministry of State, Madrid, Spain, on June 12th, 13th, 14th and 15th, 1918, for the purpose of discussing the means for avoiding interference in communications by wireless telegraphy and for the establishment of a programme which shall benefit mutually the radiotelegraph services of the various Governments represented.

2. Attached and below are three annexes marked (A), (B) and (C), in which are contained

the agreements unanimously arrived at by all the representatives present.

Annexe (A) sets forth the agreements adopted.

Annexe (B) contains the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Spanish Army and Navy.

Annexe (C) includes the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Compañia Nacional de Telegrafia sin Hilos and of the Ministry of State.

3. It is understood that all the agreements and arrangements are subject to the approval of the various Governments represented.

Capitan de Fragata,
Representing the Ministry of Marine

Major R.M.L.I.
English Representative.

Naval Lieutenant,
French Representative.

Captain,
French Representative.

Corvette Captain,
Italian Representative.

Ensign U.S.I.,
Representative of U.S.A.

Director of the Official School of
Telegraphy,
Representing the Ministry of the Interior.

Commander of Engineers and of the Army.

Representative of the Ministry of War.

Naval Lieutenant,
*Representing the Ministry of State and
of the Compañia Nacional sin Hilos.*

ANNEXE (A).

AGREEMENTS ADOPTED.

1. The Agreements of the International Radiotelegraph Convention of July 5th, 1912, will be strictly observed.

2. *Always whenever possible*, communication on a wave of 600 metres will be prohibited.

3. In accordance with the Convention, Spanish merchant ships shall continue to use the 600 metre wave when communicating with commercial coast stations and between themselves.

4. Although War vessels are entitled to use any length of wave whatever, it is agreed for mutual convenience that Spanish war vessels shall not communicate with naval and military stations or between themselves on 600 metres, but with the wavelengths specified in the Annexe (B).

5. It is agreed that inter-communication between Spanish coast stations, whether military, naval or commercial, shall not be made with a 600 metre wave, but with the wavelengths fixed and specified in the Annexes (B) and (C).

6. When a Spanish military, naval or commercial coast station desires to send a message to a Spanish coast station (commercial) which listens-in on a wave of 600 metres, the call will be with a wave of 600 metres and immediately afterwards they will give each other the conventional signals to change over to the 900 metre wave, and all subsequent communication will take place on that wave.

7. No operator of a coast station or ship station shall listen-in for more than one wavelength during the same period of time.

8. As far as possible, efforts shall be made that Spanish wireless telegraph stations do not interfere with the advices transmitted by coast stations at fixed hours or with the familiar calls for assistance (*llamadas de auxilio*).

The hours at which those advices are transmitted by stations on a wave of 600 metres are at present as follows:—

Station.	Call Signal.	Time (G.M.T.).
Casablanca ..	CNP	0245, 1045, 1845.
Gibraltar ..	BYW	0830, 2030.
Monsanto ..	CTV	0145, 0945, 1345, 2145
Oran ..	FUO	0030, 1400.
Toulon ..	FUT	0930, 2040.

Wavelengths longer than 600 metres, on which the aforementioned advices are transmitted, are not used in the Spanish organisation given in the Annexes (B) and (C).

9. As far as practicable, the wavelengths which have been adopted by all the nations for their press messages will be respected and not interfered with.

No press message shall be transmitted with a 600 metre wave.

10. With the object of obviating interference by the North American, English and French stations with the Spanish stations, the wave-

lengths selected in the Annexes (B) and (C) will not be changed as far as possible.

11. No call signal or any other working signal shall be made more than three times in each call, and no call signal shall be repeated more than three times in a quarter of an hour. (International Radiotelegraph Convention of London, July 5th, 1912, Articles XXV and XXVI.)

12. All nations represented agree to take the necessary steps to obtain the most exact synchronisation possible at all their stations with a view to ensuring the efficiency of the organisation of wavelengths given in the Annexes (B) and (C), and so that the intermediate wavelengths of 300, 750, 1050, 1350, 1650, 2200, 2750, etc., shall remain free for the use of North American, English and French warships and stations.

13. All communications by wireless telegraphy shall be limited as far as possible.

14. Meetings of a semi-official character will be held in Madrid every six months (June 1st and December 1st) between the representatives of the United States, England, France and Spain, with the object of exchanging impressions regarding:—

- (a) Mutual organisation;
- (b) Means for eliminating interference;
- (c) Change of wavelengths;
- (d) Complaints.

ROYAL DECREE OF

18TH JANUARY, 1920.

On wireless telegraph and telephone installations for scientific purposes.

Wireless telegraph, or telephone, sending and receiving, or only receiving, installations, for scientific purposes, are divided into two classes, viz.: (1) Permanent installations; (2) Provisional installations.

Permanent installations, either for research or as a complement to meteorological observatories, or for any other purpose, will be subjected to the prescriptions of the Royal Decree dated 8th February, 1917.

Provisional installations, or those fitted with the sole object of scientific experimenting or study of any branch of wireless communication, will be permitted by the Home Minister at his discretion for a given time, under the following conditions:—

(1) Applications shall be accompanied by a full report of the experiments and researches which the applicant intends to carry out, showing the place or places destined for these experiments, with diagrams, if possible, of the aerial, transmitting or receiving apparatus and their category and importance.

(2) It must be stated for how long the licence is required in order to carry out experiments and for how many hours per day it is intended to use it.

(3) The installation shall be inspected by an appointed official of the Spanish Telegraphs, and always under the control of the local Chief of the Telegraphs.

(4) As every licence will be issued for a fixed time, at the expiration thereof the installation, comprising aerial and apparatus, shall be dismantled and the matter reported to the Director of Posts and Telegraphs.

(5) Employing the installation for other than experimental and research purposes

will entail a fine upon the licensee of pesetas 500 to 2,000, in addition to the confiscation of apparatus and aerial, which shall become the property of the telegraph authorities.

(6) The licensee shall bear all expenses consequent upon the official inspection of this class of installation, in accordance with

the stipulations of the Director of Posts and Telegraphs.

(7) Installations licensed for experiments in transmission shall be operated only at the hours and on the wavelength authorised by the Director of Posts and Telegraphs, in order to prevent interference with official and public services.

CANARY ISLANDS

CONSTITUTE at the present time a colony of Spain, and are administered by Spanish representatives.

CONTROL.

Wireless telegraphy in the islands is under the control of the Compañía Nacional de Telegrafía sin Hilos, which possesses two stations, one at Teneriffe and the other at Las Palmas.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. B. Walsh	Chief Engineer	Teneriffe.
Mr. W. Haywood	Chief Engineer	Las Palmas.

The Teneriffe station sends out Press Bulletins in Spanish daily at 0230, also a meteorological report in code is transmitted twice per day to Carabanchel, a military station in Madrid. Under the jurisdiction of the Canary Islands falls the military radio station at Cabo Juby, on the African mainland. This is a 3 kW. Telefunken set.

ADMINISTRATION.

No special laws and regulations exist under which wireless telegraphy and telephony are administered, their working being regulated in accordance with the International Rules.

STRAITS SETTLEMENTS.

(See Maps 18 and 22)

Including : Christmas Island, Labuan, Cocos Islands.

THE Crown Colony of the Straits Settlements comprises Singapore, Penang, and Malacca.

The administration is vested in the hands of a Governor, aided by an Executive Council, legislation being under the direction of a Legislative Council, presided over by the Governor.

ORGANISATION.

Commercial wireless telegraph stations have been erected at Paya Lebar, Singapore and Penang. These installations are Government land stations under the control of the Postmaster-General, Mr. H. C. Sells.

A private wireless station was opened at Christmas Island on June 1st, 1923. This station is owned by Messrs. The Christmas Island Phosphate Company, Ltd.

The Brunei Government opened three small 60 watt C.W. stations in August, 1921, for inland communication at Brunei, Labuan and Temburong, thus placing Brunei in direct telegraphic communication with the outside world.

Wireless telegraphy is a State monopoly, but licences to erect and work stations are issued to private companies or individuals.

ADMINISTRATION.

The administration of wireless telegraphy is regulated by the Wireless Telegraph Ordinance of 1912, together with the regulations issued thereunder, which are printed *in extenso* below.

A—Ordinance No. 55, Part V, Wireless Telegraphy.

B—Regulations thereunder.

ORDINANCE No. 55.

PART V.

WIRELESS TELEGRAPHY.

A 33. (1) In this Part the expression "wireless telegraphy" means any system of communication by telegraph, as defined in Part I, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(2) Nothing in this Part shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

34. The Governor may, whenever he deems it expedient to do so, licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

35. (1) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony, except under and in accordance with a licence granted by the Governor.

(2) Every such licence shall be in such form and for such period as the Governor in Council determines, and shall contain such terms, conditions and restrictions on and subject to which the licence is granted as the Governor considers desirable in the public interest.

36. (1) Any person who establishes a wireless telegraph station or installs or works any apparatus for wireless telegraphy without a licence shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term which may extend to twelve months, and in either case shall be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence.

(2) No proceedings shall be taken against any person under this Part, except with the previous sanction of the Public Prosecutor.

(3) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction, without a licence, he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

37. (1) The Governor in Council may make regulations for

(a) Prescribing the form and manner in which applications for licences under this Part are to be made;

(b) Prescribing the fees payable on the grant of any licence;

(c) Regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph

station lawfully established, installed or worked in the Colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(d) Prohibiting, except with the special or general permission of the Postmaster-General of the Colony, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Colony.

(e) Prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor sees fit to make and either in all cases or in such cases as are deemed desirable.

(2) No regulations made in respect of the matters described in clauses (c), (d) and (e) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

38. When an applicant for a licence proves to the satisfaction of the Governor that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions and restrictions as the Governor thinks fit, but shall not be subject to any rent or royalty.

39.—Every omission or neglect to comply with, and every act done or attempted to be done contrary to this Part or any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any licence has been issued, shall be deemed to be an offence against this Part, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

40. Any convictions, forfeitures and fines under this Part or any regulations made thereunder may be had and recovered before a District Court.

REGULATIONS.

B In exercise of the powers conferred by section 6 of the Wireless Telegraphy Ordinance, 1912, the Governor in Council is pleased to make the following regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraphy station lawfully established, installed, or worked in the Colony or the waters thereof, and in particular the

said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship whether British or foreign shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission of the Postmaster-General of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that H's Majesty's Government should have control over the transmission of messages by wireless

telegraphy; the use of the wireless telegraphy on board merchant ships whether British or foreign while in the waters of the Colony shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. The Regulations made on the 30th December, 1918, and published as Notification No. 5 in the *Gazette* of the 3rd January, 1919, are hereby cancelled.

E. C. H. WOLFF,
Clerk of Councils.

SUDAN (ANGLO-EGYPTIAN)

(See Maps 25 and 29)

BY a convention between the Egyptian and British Governments, signed at Cairo on January 19th, 1899, the administration of the territory south of the 22nd parallel of N. latitude lies in the hands of a Governor-General appointed by Egypt with the assent of Great Britain. All ordinances, laws and regulations are made by the Governor-General in Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. H. Wynne	Director of Posts and Telegraphs	G.P.O., Khartoum
Vacant	Chief Engineer, P. & T. .. .	G.P.O., Khartoum
Lieut. R. T. Williams, Royal Corps of Signals	Wireless Engineer	G.P.O., Khartoum
Mr. A. J. Boscott	Assistant Wireless Engineer ..	G.P.O., Khartoum

ORGANISATION.

The first wireless installation in the Sudan was fitted at Port Sudan in the beginning of 1915, the first three inland stations, Nasser, Malakal, and Gambela, being fitted in the autumn of the same year. Other inland stations have since been added.

All stations have spark transmission, except Khartoum (S.U.L.), which is C.W. C.W. transmitters are being installed at Port Sudan (S.U.D.), El Fasher (F.S.R.), Nyala (N.Y.R.), and Geneina (G.N.R.), but will retain their spark sets. C.W. reception is at present installed at Malakal (M.L.R.), Port Sudan (S.U.D.), and El Fasher (F.S.R.). No arrangements are yet in force for communication with aircraft or for the transmission of time, weather, hydrographic, press signals, or direction finding.

ADMINISTRATION.

The Regulations affecting Radiotelegraphy in the Sudan are carried out under an Ordinance issued by the Governor-General, and dated at Khartoum, June 4th, 1906. No special regulations have been issued in pursuance of the Ordinance of 1906, and the service is conducted under the Provisions of the International Radiotelegraph Convention, 1912, and the Regulations for its execution. No licences for private wireless stations have hitherto been issued.

A--Wireless Telegraphy Ordinance.

AN ORDINANCE FOR CONSTITUTING WIRELESS TELEGRAPHY A MONOPOLY OF GOVERNMENT.

No. 2 of 1906.

A This Ordinance may be cited as "The Wireless Telegraph Ordinance, 1906."

No person shall install or make use of any apparatus for wireless Telegraphy or transmit or receive messages by means of any such apparatus within the Sudan except the Department of Telegraphs or a duly authorised officer or official of the Sudan Government, unless such person is in possession of a special licence in writing from the Governor-General.

SWEDEN
(See Maps 3, 9 and 16.)

CONTROL.

WIRELESS telegraphy, except in so far as the Navy is concerned, has been placed in the hands of the Kungliga Telegrafstyrelsen, which is a body under the supervision of the Minister of Communication and of which the Radio Bureau forms a special department.

No private companies, societies or individuals are permitted to work wireless telegraphy or erect stations without a concession from the Government.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. S. E. J. Lübeck	Minister of Communications	Stockholm
Mr. Sven Ludvig Herman Rydin ..	Director-General (Head of the Kungliga Telegrafstyrelsen)	Do.
Mr. S. Ljungqvist	Chief of Radio Bureau	Do.
Mr. A. S. Litström	Inspector of Wireless Installations	Do.
Mr. J. G. Holmström	Director of Radiotelegraphic Instruction ..	Do.

ADMINISTRATION.

Wireless telegraphy and telephony are controlled by the Act of August 31st, 1907, the Royal Decree of May 13th, 1921, and the Statute 514 of December 23rd, 1915, concerning the equipment of vessels:—

- A—Act of August 31st, 1907.
- B—Royal Decree of May 13th, 1921.
- C—Extract from Statute 514 of December 23rd, 1915.
- D—Form of Licence.
- E—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams (see Norway).

ACT OF AUGUST 31ST, 1907.

A CONCERNING THE ESTABLISHMENT AND WORKING OF INSTALLATIONS OF RADIOTELEGRAPHY AND RADIO-TELEPHONY.

1. Whosoever desires to establish in Sweden on land or on board a vessel permanently, moored in Swedish waters, an electric installation of radiotelegraphy or radiotelephony for public or private use must apply for an authorisation from the King.
2. The authorisation of the King must likewise be applied for, by any person or persons desiring to establish on board a Swedish vessel other than permanently moored, an installation of the kind referred to in Paragraph 1.
3. The authorisation granted by the King as prescribed in paragraphs 1 and 2, can only be granted for a certain period. In granting the authorisation, His Majesty prescribes under the reservation of private rights, the manner and conditions under which the installation may be established and worked.
4. Whosoever establishes or works, without the authorisation of the King or contrary to the provisions prescribed in the authorisation, an installation within the meaning of the present law, is liable to a fine of from 25 to 1,000 kronen if the penalty incurred by this contravention is not included in the Penal Code.
5. If an installation within the meaning of the present law has been established without the authorisation of the King, or contrary to the provisions prescribed simultaneously with the authorisation, or if the authorisation has

been revoked later by the King, it is the duty of the Governors of Provinces to take the necessary steps to prevent any use being made of the installation.

6. Every fine imposed under the present law reverts to the State. Fines not paid on account of the insolvency of the delinquent are expurgated by terms of imprisonment as prescribed in the Penal Code.
7. The provisions of this law do not apply to State installations.
8. All regulations and all dispositions concerning foreign vessels not permanently moored in Swedish waters, which may be considered necessary for the proper working in Sweden of installations within the meaning of the Act, are made by the King.

ROYAL DECREE OF MAY 13TH, 1921.

B ROYAL DECREE CONCERNING THE WORKING OF RADIOTELEGRAPHIC AND RADIOTELEPHONIC INSTALLATIONS ESTABLISHED ON BOARD FOREIGN VESSELS.

Given at the Palace of Stockholm on May 13th, 1921.

I, Gustave, by the grace of God, King of Sweden, of the Goths and Vendes, make known that on the representation which has been made to us, we hereby repeal the Decree of June 20th, 1913 (No. 125), concerning the working in the Kingdom of radiotelegraphic and radiotelephonic installations established on board foreign vessels, as well as the Decree of September 4th, 1916 (No. 375), concerning the conditions to be observed by those working in Swedish territorial waters, radiotelegraphic or radiotelephonic installations established on board merchant

vessels, which Decrees are replaced henceforward by the following dispositions, decreed on account of the clause inserted at Section 8 of the law of August 31st, 1907 (No 94), relative to the establishment and working of radiotelegraphic and radiotelephonic installations.

1. Radiotelegraphic or radiotelephonic installations established on board foreign vessels, not stationary in the territorial waters of Sweden are called in the present decree radio installations on board foreign vessels.

2. (i) Radio installations on board foreign vessels must not be used in the vicinity of Swedish ports, without special authorisation to this effect, given by the "Director-General of Telegraphs" in conjunction with the "Chief of the Admiralty," and under reservation of a strict observation of the detailed regulations prescribed by the "Director-General of Telegraphs."

(ii) In the region of the territorial waters of Sweden, which is situated at a lesser distance than ten nautical miles of a Swedish coast station the radio installations on board foreign vessels must not be used except in case of distress or in order to communicate to the coast urgently.

(iii) The "Director-General of Telegraphs" must be able, after having arranged to this effect with the "Chief of the Admiralty," to suspend or restrict, except in case of distress, the use of radio installations on board of foreign vessels, even should it be proceeding in other regions of the territorial waters of Sweden than those stated in Section 2, para (ii).

3. The Director-General of Swedish Telegraphs has power to issue any necessary regulations concerning the putting out of use of radio installations on board of foreign vessels found in a region where conforming to the regulations of Section 2 it is forbidden to use such an installation.

4. The Director-General of Telegraphs will make known to navigators in the way that he judges best the regulations and rules decreed in Section 2, para. (iii), as well as those in Section 3 of the present law, once and for all time, for a certain time, or for some particular case. The said Director will also solicitate the Director of the Administration of Pilotage, the Director-General of Customs, the Departmental Authorities making inspections, and the services subordinate to them respectively, the strict observance of the laws and regulations decreed.

5. When a radio installation on board a foreign vessel is used in the territorial waters of Sweden it must, unless otherwise ordered, conform to the instructions given in the Radio Telegraphic Convention in force with the service rules attached thereto.

6. All infringements of the regulations of the present law or the regulations and orders decreed by the Director-General of Telegraphs in virtue of the same law will be punished by a fine of 25 to 1,000 crowns.

7. The offences shown in Section 6 will be dealt with by the agents of the Civil Administration.

For the competent jurisdiction in the matter of these offences the parties implicated must conform to the rules of Section 328 of the Maritime Code.

The fines imposed on the offenders in this matter will be taken by the Crown. The fines of which the amount would not be paid on account of the insolvency of the delinquent will be commuted in accordance with the penal code.

8. The regulations of Sections 6 and 7 herein described are not applicable to warships.

The present law will enter into force on June 1st, 1921.

In faith of which, etc.

Made at the Palace of Stockholm on May 13th 1921.

(Signed)

(L.S.)

(Witnessed)

(Minister of Communications.)

EXTRACT FROM SWEDISH STATUTES, 1915.

No. 514 OF 23RD DECEMBER.

Fifth Chapter.

Equipment of Vessels.

1.—Wireless Telegraph Installation.

ART. 56.

Vessels which must be provided with wireless installation.—Vessels which are used for voyages between different countries or between a country and any of its colonies, possessions or protectorates, shall be equipped with wireless telegraph installation, provided however—

That such installation shall not be required if the vessel has fewer than 50 persons on board or if although the number on board is 50 or over, this is exclusively due to the fact that the master, by reason of sickness among the crew or through other compelling, unforeseen circumstances, has been obliged to supplement the crew, or has saved persons in distress at sea, or by reason of obligation, according to law, has taken with him seamen or other persons;

And that the Board of Trade may, on application, grant exemption from the obligation of having such installation, if the Board, in view of the route or other circumstances concerning the voyage, finds that such installation is not necessary and if such application concerns:—

(a) Vessels which do not go out to a distance of more than 150 nautical miles from the nearest coast;

(b) Vessels which only in exceptional cases and incidentally have 50 persons or more on board for the reason that they take stowers or stowage labourers with them on a certain part of the voyage, and which on the one hand do not sail from one continent to another, and on the other hand are, during the said part of the voyage, between 30° northern and 30° southern latitude; or

(c) Sailing vessels which are of rather primitive construction and which it is practically impossible to equip with wireless installation.

ART. 57.

Concession and classes of vessels.—Concerning H.M.'s permission to carry out such installation as referred to in Art. 56, separate enactments have been issued.

In sanctioning such installation as aforesaid the King will fix the class in which the vessel shall be classified, in accordance with the nature of the attendance of the wireless telegraph station.

ART. 58.

Range of the installation.—The wireless installation shall be sufficiently powerful to be able to transmit in day-time, under normal conditions, signals which can be clearly distinguished at a distance of at least 100 nautical miles from the vessel.

ART. 59.

Spare installation.—Vessels which are to be equipped with wireless installation shall have a spare wireless plant. This shall be placed wholly and entirely in the upper parts of the vessel, as high up as possible, and all its parts shall be fitted up so as to be protected as much as possible.

The spare plant shall have a source of power which is exclusively intended for the spare plant, and which can be brought into action most speedily.

The source of power referred to in the second paragraph of this article shall be capable of acting for at least six hours with a minimum range of 80 nautical miles in the case of vessels for which uninterrupted attendance of the wireless installation shall have been provided, and of 50 nautical miles in the case of any other vessel.

If the main installation meets the requirements of the first and second paragraphs hereof as regards the spare plant the spare installation shall not be required.

LICENCE.

D FORM OF LICENCE FOR SHIP STATIONS.

Licence.

Delivered in view of the opening of communication of the radiotelegraphic station installed with the

permission of the King on (date) on board the Swedish vessel belonging to the Port of

The Royal Administration of Swedish Telegraphs certifies by these presents that as the result of the inspection instituted to this effect, the radiotelegraphic station above mentioned (system) fulfils the conditions cited in conformity with the regulations of the International Radio-Telegraphic Convention for the "Safety of Life at Sea" actually in force, relative to the station on board the class Stockholm..... (date)..... 192

The Director-General of Swedish Telegraphs.

Supplementary inspection made 19.. :

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SWITZERLAND

(See Maps 2, 7 and 8.)

THE Swiss Confederation is made up of the union of twenty-five separate political entities, or republics, organised into twenty-two cantons.

Supreme authority is exercised by the Federal Assembly, which consists of two Councils. Both Chambers unite to elect the Federal Assembly, which wields the supreme authority and higher executive of the Confederation.

CONTROL.

Wireless telegraphy in Switzerland is controlled by the Department of Posts, Telegraphs and Railways, but there is no special branch of the department devoted thereto.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. R. Haab	Head of the Department of Posts, Telegraphs and Railways	Berne
Dr. R. Furrer	Director-General of Post, Telegraphs and Telephones ..	Berne
M. Hauser	Assistant to the Director-General	Berne
A. Muri	Chef de la Division Technique	Berne
Dr. M. Baur	Chef de la Section "Controle et Comptabilité"	Berne
E. Nussbaum	Inspector of Telegraphs	Berne

Wireless telegraphy is a State monopoly, based on the new Federal Law affecting telegraphs and telephones, of October 14th, 1922, of which we print below the apposite clauses.

Licences are, however, granted for receiving stations only, available for a limited period, where these are to be used solely for the reception of time, weather signals, and general and technical instruction and scientific researches. We append the form of such contracts.

ORGANISATION.

In order to carry out a clause of the International Conference of October 25th, 1913, relative to an international time association, and starting with

August 1st, 1916, the International Time Signal radiated from the Eiffel Tower is on working days telephonically transmitted by the Telegraph and Telephone Department at Berne to subscribers residing in Switzerland. (See Decree of the Federal Council dated July 21st, 1916.)

The Federal Council, on March 11th 1921, granted a concession to Marconi's Wireless Telegraph Co. to establish and work an up-to-date wireless station with valve transmission of 25 kW. This station is worked by the "Marconi Radio Station, S.A.," constituted as a Swiss Société Anonyme for the purpose. The station was opened for international public service on April 12th, 1922, and works at high speed on a wavelength of 3,400.

ADMINISTRATION.

The Law of 1907 has now been replaced by the Federal Law of October 14th, 1922, regulating all telegraphic and telephonic installations and communications both wired and wireless. We print below the clauses relating to Wireless Telegraphy and Telephony.

A—Extracts from Federal Telegraph and Telephone Law of October 14th, 1922.

B—Federal Decree of 21st July, 1916, establishing Telephonic instead of Wireless Reception of International Time Signals.

EXTRACT FROM LAW OF OCT. 14TH, 1922.

A—*The Federal Assembly of the Swiss Confederation. In accordance with Article 36 of the Federal Constitution; in view of the message from the Federal Council of 6th June, 1921:—*

DECREES.

ART. 1. The Administration of Telegraphs has the exclusive right to establish and exploit sending and receiving installations or installations of any kind used for electrical or radio-electrical transmission of signals, pictures or sound.

ART. 2. (1) The telegraph and telephone rules do not apply to sending and receiving installations which are used for the electrical transmission of signals, pictures and sounds, and—

(a) Which are necessary for the working of railways;

(b) Whose conductors neither cross the Swiss frontier nor encroach either on the public domain or on property not belonging to the owner of the installation;

(c) Which are established by military or public authority for exclusive use in military affairs.

(2) The Federal Council may authorise other exceptions to the telegraph and telephone rules.

ART. 3. The competent authorities may grant concessions for the establishment and exploiting of installations intended for the electrical and radioelectrical transmission of signals, pictures and sounds.

(Art. 4 omitted).

ART. 5. (1) The Federal Council may, when the greater interests of the country necessitate such action, suspend public correspondence or restrict and control the use of installations under the telegraphic administration. It may also take similar steps in the case of installations worked under concessions or of railways using electrical or radioelectrical transmissions of signals, pictures or sound.

(2) Such measures do not admit the right of any claim for indemnity nor for repayment of taxes and dues.

(Art. 6 to 20 (1) omitted. These are mainly concerned with telegraphic routine and charges and with penalties for the infraction of regulations.)

ART. 20. (2) A subscriber is forbidden to fit other wires or apparatus to those belonging to the Telegraphic Administration without their consent.

(Articles 21 to 41 omitted. These refer mainly to telephone subscribers and penalties for infraction of regulations).

ART. 42. (1) The following offences are punishable either by a fine or by imprisonment for one year or more:—

(a) Establishing, exploiting or using without leave or in a manner contrary to the terms of the licence, sending or receiving installations or installations of any kind which would be subject to a licence and used for the electrical or radioelectrical transmission of signals, pictures or sounds.

(b) Imparting to a third party, without authority from the Administration of Telegraphs, any information regarding signals pictures or communications intercepted by a wireless station.

(c) Accepting remuneration of any kind for the transmission by radiotelegraphy under the terms of the licence of messages of public interest.

(d) *Relates to misuse of land-lines.*

(e) Fitting other apparatus or wires to those belonging to the Federal Administration without their consent.

(2) The use of sending or receiving installations (employed for electrical or radioelectrical transmission of signals, pictures or sounds) for the free transmission of communication which are subject to charges or the unauthorised use of any privilege of exemption from such charges, is punishable by a fine of 3 to 1,000 francs.

(3) The telegraphic or telephonic charges which the accused has endeavoured to avoid must be paid in every case.

(4) The offender is punishable even if the act was committed through negligence.

ART. 43. The punishable offences enumerated in Arts. 39 to 42 as well as the fiscal contraventions punishable by imprisonment, are matters for the federal jurisdiction in accordance with Arts. 125 and onwards, of the Federal Law of 22nd March, 1893, concerning the Federal judiciary organisation.

ART. 44. Deals with minor offences punishable by fines not exceeding 500 francs which may be imposed by the Postal and Railway Authorities

and with the rights of appeal to a competent tribunal.

ART. 45. Federal officials and employees, as well as the police authorities of the cantons, must co-operate in the detection and prosecution of punishable offences specified under the present law. The competent authority of a canton must stop at once the working of any illicit telegraphy or telephony by removing the means of transmission employed.

Berne, the

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FEDERAL DECREE.

The Director-General of Telegraphs.

TELEPHONIC TIME SIGNAL SERVICE.

SECTION A.

Decree of the Federal Council dated July 21st, 1916.

B *The Swiss Federal Council, acting on the suggestion of its Postal and Railway Department, and in view of the Federal decision of March 27th, 1914:—*

DECREES

1. That the international radiotelegraphic time signal radiated daily at 10.56 and at 11 o'clock (H.E.C.) from the Paris Observatory by the Eiffel Tower Station, shall be—during working days—retransmitted telephonically by the Administration of Swiss Telegraphs and Telephones at Berne.

2. Any regular telephone subscriber may take up a subscription to the telephonic time signal, arranging therefor with his telephone exchange.

3. Subscriptions are monthly or annual, and are valid for the civil month or civil year.

The rates of subscription are:

(a) Fr. 2.50 per month, or part of a month.

(b) Fr. 25 per year.

For ten months at least they must be paid in advance.

4. Over and above the possibility of regular subscriptions, telephone subscribers may arrange to be supplied with odd time-service messages on such circuits as receive them. Each separate message will be charged for at the rate of 20 centimes, and this fee will be included, with ordinary conversation charges, in the monthly account.

5. The Administrator of Telegraphs and Telephones will accept no responsibility with regard to any irregular working of the Telephonic Time-Signal Service; nevertheless every endeavour will be made to assure and develop the service.

6. If any interruption in telephonic transmission of the time-signal last for more than seven consecutive days, without this arising from any fault on the part of the subscriber, the subscription fee will be refunded proportionately to the duration of the interruption.

7. Every effort shall be made to carry this edict into effect on and from the 1st August, 1916.

The Postal and Railway Department shall take steps to carry this out.

Dated Berne, 21st July, 1916.

SECTION B.

Method of Administration.

1. Every telephone subscriber who desires to subscribe to the Telephonic Time-Signal Service must address a written request to his telephone exchange showing exactly what kind of subscription he desires to take up (see Article 4 of this section, paragraph (a) to (c).)

2. The telephone exchange which receives an application for such a subscription may, under this rule, accede to the application immediately.

On the reception of a first request for a subscription, the Telephone Exchange puts itself immediately in touch either with the Council Station through whose intermediary the time-signal will be sent, or with its own local centre.

3. The originals of all applications for subscriptions must be sent to the Chief Office, through the intermediary of the local centres.

4. (a) The fees for annual subscriptions must be paid in advance for December, together with the half-yearly fees for the ordinary telephone service.

For periods of less than ten months, starting with the first day of the subscription and until the end of the year, the tax is collected on the basis of the tariff applicable to monthly subscriptions.

An annual subscription becomes automatically renewable from year to year, and may be cancelled at any time upon giving eight days' notice. If, however, it has not run for at least ten months, counting from the beginning of the year up to the date of cancellation, the rate of tax applicable is that of a monthly subscription.

(b) Fees for monthly subscriptions for a settled period (temporary subscriptions) are payable in advance, and for the whole duration of the subscription.

In default of advice to the contrary on the part of the subscriber, his subscription is considered as cancelled on the expiry of the agreed period.

(c) Monthly subscriptions of indeterminate duration are renewable automatically month by month. They may be cancelled at the end of a month by notice given at least eight days in advance, the subscriptions being payable monthly and in advance.

(d) Requests for reception of odd time-service messages are only granted in the case of lines of some importance, and on condition that they are made at latest by 10.50 a.m. Applicants are rung up at 10.55 a.m.

Applications are noted by entering the number of the subscriber on tickets specially prepared for this purpose. These tickets serve as the basis for the rendering of accounts.

When it has not been possible to attend to an application, because the subscriber's line was engaged his enquiry is charged as a local conversation. Fees for odd time-signal messages are charged for at the end of each month on the same invoice as conversation charges.

5. Subscription rates and charges made for odd time-signal messages come under subsection 2(c) of the accounts for messages, and must in consequence be entered, duly classified (see Article 4 of section (a) above) on Form No. 600 under "Other Receipts."

6. The commission allowed to exchange proprietors attached to central stations of Class III, and of intermediary stations, who have to co-operate in the telephonic time-service amounts to 25 per cent. on receipts. This commission is taken into consideration when the annual telephone accounts are adjusted.

Time-service communications in transit should be recorded in the same way as ordinary conversation in transit.

7. When the time-signal message is transmitted to an intermediary station linked up with a central station of Class III, the latter has only a right to a commission of 2 cents per communication in transit, and the commission of 25 per cent. on the message is allotted to the proprietor of the intermediary station.

TANGANYIKA TERRITORY

(LATE GERMAN EAST AFRICA)

(See Maps 25, 28 and 29)

THE territory of German East Africa, conquered in 1918, was divided between the British and Belgians. The British area became Tanganyika Territory. It is administered by a Governor assisted by an executive council.

CONTROL AND ADMINISTRATION.

There are at present no wireless stations in the territory, except one at Kigoma on Lake Tanganyika, which forms part of the Belgian Congo system (see page 85), nor has any legislation been formulated for the control of wireless telegraphy.

TUNIS

(See Maps 24 and 26)

TUNIS is a protectorate of France, under a Resident General, with Sidi Mahomed El Habid Bey at the head of the State.

CONTROL AND ORGANISATION.

The official wireless stations are controlled by the French Naval and Military authorities.

Private receiving stations may be installed without special licence, but subject to permission from the Director-General of Posts and Telegraphs, and to an annual tax of 20 francs. Leave to erect private transmitting stations may also be obtained from the Director-General of Posts and Telegraphs.

ADMINISTRATION.

For the laws and regulations relating to wireless in French Colonies, see under France and Algeria.

UGANDA PROTECTORATE.

(See Maps 25 and 28)

THE administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and Legislative Council.

CONTROL.

The general control of wireless telegraphy is under the administration of the Postmaster-General, Nairobi.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

<i>Official.</i>	<i>Title.</i>	<i>Address.</i>
Capt. W. G. Tucker	Telegraph Engineer	Entebbe
Mr. R. Rabson ..	Assistant Telegraph Engineer	Do.

ADMINISTRATION.

Wireless telegraphy is administered under the following Ordinance:

ORDINANCE.

1. This Ordinance may be cited as "The Wireless Telegraphs Ordinance, 1908."

2. No person shall use or establish any apparatus or installation for the purpose of operating wireless telegraphs without a licence from the Governor.

Any person contravening the terms of this section shall be liable on conviction to a fine not exceeding Rs. 1,500 or imprisonment

of either kind for a term not exceeding twelve months, and any apparatus or installation in respect of which an offence under this section is committed may be forfeited and sold or disposed of as the Governor may direct.

3. It shall be lawful for the Governor from time to time by rules to prescribe the terms and conditions upon which licences to use or establish apparatus or installations for the purpose of operating wireless telegraphs may be granted.

URUGUAY

(See Maps 49, 51 and 53.)

THE independence of the Republic of Uruguay was declared on August 25th, 1825, and recognised by Treaty on August 27th, 1828. Legislation is administered by a Parliament of two Houses, the Executive being in the hands of a President elected every four years, and a National Administrative Council composed of nine members.

CONTROL.

Wireless telegraphy in Uruguay is controlled by the Government, the department in charge being the Ministry of War and Marine. The Government ship stations are also under the control of the Minister of War and Marine. There are no privately owned stations. There are no radiotelegraphic clubs or societies, in fact wireless telegraphy is entirely a Government monopoly.

ORGANISATION.

The installation of wireless telegraphy in Uruguay was authorised by a Government Decree dated June 22nd, 1910. This Decree provided for one long-distance station at Montevideo, minimum range 500 miles; two situated respectively at Paso de los Toros and Rivera (Northern Frontier), with minimum range of 372 miles; two respectively situated at Lobos Island and the English Bank, each with minimum range of five miles; besides installations on the various Government vessels. By the end of the year 1911 the service (supplemented by two Military Field Stations) was in working order.

The Montevideo station, opened to the public in December, 1911, and standing on a hill three miles from the river, is the only installation doing international work. Its location is called Cerrito de la Victoria, and the wireless station generally goes by the name of "Cerrito." The installations situated at Rivera and Paso de los Toros are employed solely for military purposes, and only in times of crisis, should a breakdown of the ordinary wired service eventuate, are they used for public messages.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Arturo Gaye ...	Acting <i>pro tem.</i> as Minister for War	Montevideo
Sr. Bernardo Kay ..	Engineer Inspector-General ..	Calle Pereira 74, Montevideo
Sr. Juan P. Camera	Secretary 7.	Calle Ituzaingo 1278, Montevideo

ADMINISTRATION.

The first Decree regulating the subject was issued by the Ministry of War and Marine on September 5th, 1911, and was followed by a Decree dated January, 1912. Under its provisions *all ships calling at the ports of the Republic and destined for passenger service are obliged to be fitted with wireless apparatus.*

We print here the text of both the Decrees above referred to:—

A—Decree of September 5th, 1911.

B—Decree of January, 1912.

C—Decree of August 14th, 1922, replacing the Superior Decree of October 20th, 1914, with the Superior Resolution of November 14th, 1919.

DECREE OF SEPTEMBER 5TH, 1911.

A 1. The National Wireless Telegraphy Office is under the direct control of the Ministry of War and Marine, with the Engineer Inspector-General at its head.

2. The National Wireless Telegraph Office is in charge of and controls all the radio-

telegraphic stations, whether fixed or military movable ones, on vessels or on lighthouses, together with their stuff, apparatus and installations.

3. The Inspector-General will at such times and under such circumstances as he thinks proper make visits of inspection of the stations in order to take personal cognisance of their

requirements, and he exercises in regard to the staff, whether military or civil, the character of a staff commander.

4. On the occasion of manœuvres the Inspector-General will designate the country stations which are to take part in accordance with the instructions he receives as to the requirements of the occasion.

5. It is one of the duties of the National Wireless Telegraph Office to propose to the superior department the construction of fresh stations and to report regarding the means for acquiring the same.

6. The Inspector-General controls the sums received for transmission of telegrams, which sums shall be deposited in the Bank of the Republic to the order of the Minister of War and Marine.

7. The National Wireless Telegraph Office will make contracts with the General Post and Telegraph Office and with the shipping companies to be submitted for approval to the Minister of War and Marine; similarly the office is empowered to draw up with the administrations of the neighbouring States radiotelegraphic agreements with the object of improving and amplifying the international wireless telegraph service, all of which shall be submitted for approval by the higher department.

8. The Minister of War and Marine will notify the International Office in Berne of the creation of the National Wireless Telegraph Office in Uruguay, so that in future all questions concerning wireless telegraphy in Uruguay may be referred direct to it.

9. The Inspector-General will report quarterly to the Minister of War and Marine regarding the general conditions and working of the service under his charge, and will compile an annual memorandum upon the general work of his department.

DECREE OF JANUARY, 1912.

B 1. Commencing from May 1st of the present year (1912) all the ships carrying passengers between the harbours of the Republic and those of foreign countries shall be fitted with radiotelegraph installations.

2. The said installations shall be designed to receive and transmit telegrams up to a distance of not less than one hundred kilometres on the ships of river navigation, and four hundred kilometres on those of the oceanic navigation.

3. The installations shall be permanently kept in good conditions of working, and capable of intercommunicating with the stations of the Republic.

4. The stations shall be in charge of persons well acquainted with the use of radiotelegraph apparatus.

5. The service of the stations shall be entirely in accordance with the provisions of the International Radiotelegraph Convention.

6. The agents of the companies will inform, before expiration of the time fixed, the General Inspector of the National Service of Wireless Telegraphy of the characteristics, system, power, etc., of the radiotelegraph apparatus to be fitted on the ships of their companies.

7. The ships which after expiration of the time fixed by Article 1 have not complied with the provisions of this Decree shall not be authorised to carry passengers in the harbours of the Republic.

8. Those ships which do not keep their wireless apparatus in proper working conditions shall be liable to have applied to them the penalty specified in the previous article (7).

9. The General Inspector of the National Service of Wireless Telegraphy is hereby entrusted with seeing that the provisions of this Decree are duly complied with.

DECREE OF AUGUST 14TH, 1922.

C ART. 1.—The Superior Decree of October 20th, 1914, referring to installations of Wireless Telegraphy in this country, as also the modifications made to same contained in the superior resolution of November 14th, 1919, have been cancelled.

ART. 2.—It is allowed to install complete radiotelegraphic and radiotelephonic stations or receiving stations only in the territory of the Republic, except in places where Government stations are installed, nor at a distance of under 50 kilometres from the River Plate or the frontier with Argentina when not in towns of any importance. The radiotelegraph stations merely for study and those of radiotelephonic which cannot be used for telegraphy can also be installed in places where Government stations exist.

ART. 3.—The installation and working of the radiotelegraphic stations authorised by the aforementioned article will be subject to the following conditions:—

(a) In every case when installing a station, if it be in the Department of Montevideo, the person interested must previously communicate in writing to the General Inspection of Wireless Telegraphy the following data:—Use for which it is destined, class and system of same with specification of power in the antenna and origin of energy with which it will work, class of antenna, height and length of same, place where it will be installed and name of the proprietor, forwarding also a diagram or plan with a memorandum describing the projected installation. In other departments the aforementioned communication should be made to the respective military authorities or to the Chief of Police, who will have it forwarded to the General Inspection of Wireless Telegraphy and there being no observations to be made the data will be noted in the register, a serial number will be allotted and the wavelength with which it may work will be fixed; installation may then be commenced and when it has once been inspected and tested, communication can be commenced.

In the case of a Receiving Station the person interested will communicate to the corresponding authorities in accordance with the aforementioned giving in such an event only the details which may be requested from him.

(b) They may only be employed for private use or for study, it being absolutely prohibited to carry on a public service or to exploit it in any way.

(c) They will be used exclusively for the communications in the country, and may not have a larger range than 20 kilometres for studying purposes, and all others not over 100 kilometres if there be any Government station in that radius and up to 200 kilometres if no such station exists, and all these must only work with the wavelength approved for them.

(d) The stations which are not for private use or purely for reception may only be worked by persons having a licence as operators at least of the third-class, issued by the General Inspection of Wireless Telegraphy.

(e) To send messages to parts where there are Government stations all transmission must be made to these stations, payment being made at half the tariff rate for messages.

(f) In no case may an installation be erected nearer to a Government station than the following distances:—In Montevideo: Experimental stations 2 kilometres, all others 10 kilometres; in the interior 1 and 5 kilometres respectively.

(g) In addition to the preceding conditions, the stations will be subject to the dispositions and existing or future regulations for telegraphy, wireless or otherwise, and in the event of these regulations not being followed or when the Government so desires, they can be closed by the respective authorities, and the proprietors can have no right to claims or indemnifications whatsoever.

ART. 4.—For the installation and working of radiotelephonic stations which can also communicate radiotelegraphically, the aforementioned conditions will be observed, and for those only radiotelephonic, the following:—

(h) They can be employed for private or business purposes, as also for public use, for study, educational, information, commercial, meteorological, advertising, concerts and, in general, everything in connection with intellectual instruction or of general interest.

(i) When they are employed for the preceding purposes, that is, for commercial or exploitation purposes, the person interested must previously apply in writing to the Ministry of War and Marine for the technical authorisation corresponding to the installation of the station or stations which will be used for the said purposes, and there must be given in the respective application the same information as is required in (a) of Art. 3 of this Decree. The Ministry of War and Marine will pass it to the General Inspection of Wireless Telegraphy who, if they have no technical observations to make, will note down the characteristics in the respective register, will allot it a serial number and will then forward to the petitioner a certificate of authorisation for the requested installations.

(j) For the exploitation authority which must come after the technical authorisation, those interested must apply to the corresponding Ministry in accordance with existing or future regulations to that effect.

(k) The installation of stations not destined for exploitation purposes as also for those of study or solely receiving stations, will come under the regulations in (a) of Art. 3, with the difference that the wavelength of working will be determined by the respective authorities.

(l) The General Inspection of Wireless Telegraphy will put at the disposal of the Directorate-General of Posts, Telegraphs and Telephones the bands of wavelengths destined for the use of private radiotelephonic stations, and will reserve those corresponding to the Government stations.

(m) The stations destined for exploitation must be attended by native operators who must hold a first-class professional certificate, issued by the General Inspection of Wireless Telegraphy. These stations may not operate without having been inspected previously by the aforementioned authorities and who may also inspect the working of same if they deem it necessary.

(n) Radiotelephonic communications can be made at any distance within the country, but for the exterior only up to 50 kilometres, with the exception of those made from the Capital of the Republic, and if for ships can be made up to a distance of 100 kilometres, and if for other parts up to 250 kilometres. When the State possess their own stations, distant communications for the exterior and interior must be made by said stations. In every case the wavelengths authorised by the authorities only will be used, and the Cerrito Station or others that may be available in future will be directed to control them and at the same time to see that the said communications conform to the regulations in force.

(o) In addition to the preceding established conditions the working of the stations will be subject to the existing and future regulations on wireless or other telephones as far as applicable, and in the event of the regulations not being adhered to, the said authorisation can be taken away and the stations closed by the authorities as deemed convenient and the proprietors shall have no claim to indemnification whatsoever.

ART. 5.—Ships carrying the National flag may install radiotelephonic stations, subject to the same regulations as above stations and they must also conform to any international conventions subscribed by this country.

ART. 6.—The General Inspection of Wireless Telegraphy will be in charge of watching and controlling by means of their own stations, the observance of the proper compliance with all the regulations of this Decree, and all operators of wireless telegraphy must comply with and obey any professional direction relating to the service, which may be made by the Government's stations, which shall always have preference in the transmissions of any communications.

ART. 7.—Communicate, etc.

URUGUAY, BOLETIN OFICIAL.

August 14th, 1922.

UNITED STATES OF AMERICA

(See Maps 38, 39, 40, 41, 42.)

Including the Territory of Alaska.

N.B.—There are, moreover, *DEPENDENCIES* administered by the U.S.A. Government. Their rule is undertaken by a Governor and staff appointed by the President. Porto Rico and the Philippines belong to this division, although provided with Representative Government. Guam, in the Marianne Archipelago (Pacific Ocean), and the Samoan Islands are pure Dependencies administered by the U.S. Navy Department. Wireless in all these instances is controlled by the Navy Department in war time, but in peace time the radio stations of Porto Rico, Hawaii and Alaska are under the jurisdiction of the

Department of Commerce, and all commercial transmitting radio stations operated in these dependencies must be licensed by this Department, and the operators of such stations must also be licensed.

The "CANAL ZONE" on the Isthmus of Panama ranks as a Dependency, but it has been judged best to print the wireless particulars relating thereto separately under the heading "Panama—Canal Zone."

CONTROL.

THE Congress of the United States has delegated to the Department of Commerce the duty of the enforcement of the Wireless Communication Laws and the International Radiotelegraph Convention, and the work is handled through the Bureau of Navigation, Washington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Officials.	Title.	Address.
<i>Navy—</i> Commander D. C. Bingham	Acting Director of Naval Communications	Washington
<i>Army—</i> Maj.-Gen. Sir G. O. Squier, K.C.M.G. ..	Chief Signal Officer	Washington
<i>Commerce—</i> Mr. Herbert Hoover	Secretary of Commerce	Washington
Mr. S. B. Davis	Acting Secretary of Commerce	Washington
Mr. D. B. Carson	Commissioner of Navigation	Washington
Mr. A. J. Tyrer	Deputy Commissioner of Navigation ..	Washington
Mr. W. D. Terrell	Chief Supervisor of Radio	Washington

There are, in addition, 10 Supervisors of Radio, 7 inspectors and assistant inspectors, stationed at various districts established by the Bureau of Navigation.

ADMINISTRATION.

In 1910 an effort to regulate radio communication in the United States was made, when a Bill was prepared and passed by the Senate. It was not reached on the House of Representatives calendar, and therefore did not become effective.

The first Act requiring radio apparatus on certain passenger-carrying vessels was approved June 24th, 1910. Under this Act the Secretary of Commerce and Labour organised on July 1st, 1911, the radio service, composed of three inspectors, with headquarters at New York, N.Y., Baltimore, Md., and San Francisco, Cal.

The second Act, approved July 23rd, 1912, amended the above Act and is printed below.

The Act to regulate radio communication was approved August 13th, 1912. Under this Act transmitting stations and radio operators are licensed by the Secretary of Commerce. Transmitting stations are inspected to ascertain whether they comply with the requirements of the law. Radio operators are examined in order to determine their qualifications.

In addition to the above-mentioned Acts, the Department also enforces the London International Radiotelegraphic Convention rules of 1912, to which the United States is a party.

On March 4th, 1913, the Act abolishing the Department of Commerce and Labour and creating the Department of Commerce and the Department of Labour became effective. The enforcement of the radio laws was placed under the jurisdiction of the Secretary of Commerce.

The items published in the following pages are :—

A—Act of July 23rd, 1912.

B—Act of August 13th, 1912.

C—Regulations, 1912.

D—Regulations governing Ship and Land Radio Stations (as amended April 15th and May 1st, 1920).

- E**—Regulations governing Radio Operators.
- F**—General Information.
- G**—Certificate of Radio Inspection.
- H**—Master's Certificate of Radio Apparatus.
- I**—Radio Declaration, Form 753a.
- J**—Master's Certificate, Clearance Form 753b.
- K**—License for General Public Service Coast Radio Station.
- L**—License for Ship Radio Station.
- M**—License for Land Radio Station.
- N**—License for Amateur Radio Station.
- O**—License to Radio Operator, Commercial Extra First Grade.
- P**—License to Radio Operator, Commercial Grade.
- Q**—License to Radio Operator, Amateur First Grade.
- R**—License to Radio Operator, Amateur Second Grade.
- S**—Notice to Berne Bureau.
- T**—Act concerning International Communication.
- U**—United States Radio Compass Stations.
- V**—Public Resolution No. 48, dated June 5th, 1920 (amended April 14th, 1922.)

A An Act approved July 23rd, 1912, amending section 1 of an Act entitled "An Act to require apparatus and operators for radio communication on certain ocean steamers," approved June 24th, 1910.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

"SEC. 1. That from and after October first, nineteen hundred and twelve, it shall be unlawful for any steamer of the United States or of any foreign country navigating the ocean or the Great Lakes and licensed to carry, or carrying, fifty or more persons, including passengers or crew or both, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with an efficient apparatus for radio communication, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night. An auxiliary power supply, independent of the vessel's main electric power plant, must be provided which will enable the sending set for at least four hours to send messages over a distance of at least one hundred miles, day or night, and efficient communication between the operator in the radio room and the bridge shall be maintained at all times.

"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.

"That the provisions of this section shall not apply to steamers plying between ports, or places, less than two hundred miles apart."

SEC. 2. That this Act, so far as it relates to the Great Lakes, shall take effect on and after April first, nineteen hundred and thirteen,

and so far as it relates to ocean cargo steamers shall take effect on and after July first, nineteen hundred and thirteen: *Provided*, That on cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life.

The remaining sections of the Act of June 24th, 1910, which are unchanged, read as follows:—

SEC. 2. That for the purpose of this Act apparatus for radio communication shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange, as far as may be physically practicable, to be determined by the master of the vessel, messages with shore or ship stations using other systems of radio communication.

SEC. 3. That the master or other person being in charge of any such vessel which leaves or attempts to leave any port of the United States in violation of any of the provisions of this Act shall, upon conviction, be fined in a sum not more than five thousand dollars, and any such fine shall be a lien upon such vessel, and such vessel may be libelled therefor in any district court of the United States within the jurisdiction of which such vessel shall arrive or depart, and the leaving or attempting to leave each and every port of the United States shall constitute a separate offence.

SEC. 4. That the Secretary of Commerce shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of the Government.

B AN ACT TO REGULATE RADIO COMMUNICATION.

APPROVED AUGUST 13TH, 1912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign

* The amended Act applies to vessels licensed to carry, as well as those actually carrying, 50 or more persons, etc.

nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a licence, revocable for cause, in that behalf granted by the Secretary of Commerce upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: *Provided*, That the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a licence shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

SEC. 2.—That every such licence shall be in such form as the Secretary of Commerce shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the licence is granted; that every such licence shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such licence shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such licence shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as afore-

said be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said licence for a period to be fixed by the Secretary of Commerce not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court for each and every such offence: *Provided*, That in case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a licence, to the operator on a vessel subject to the radio ship Act of June 24th, 1910.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce may grant special temporary licences to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours, and under such conditions as will ensure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

Normal Wavelength.

C 1. Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service, shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Convention in

force: *Provided*, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservation made by regulations first and second to accord with any international agreement to which the United States is a party.

Other Wavelengths.

2. In addition to the normal sending wavelength all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: *Provided*, That they do not exceed 600 metres or that they do exceed 1,600 metres: *Provided further*, That the character of the wave emitted conforms to the requirements of regulations 3 and 4 following.

Use of a "Pure Wave."

3. At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemeter, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

Use of a "Sharp Wave."

4. At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

Use of "Standard Distress Wave."

5. Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force, except on vessels of small tonnage unable to have plants insuring that wavelength.

Signal of Distress.

6. The distress call used shall be the international signal of distress • • • — — — • • •

Use of "Broad Interfering Wave" for Distress Signals.

7. When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

Distance Requirement for Distress Signals.

8. Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

"Right of Way" for Distress Signals.

9. All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

Reduced Power for Ships near a Government Station.

10. No station on shipboard when within fifteen nautical miles of a naval or military station shall use a transformer input exceeding 1 kw., nor, when within five nautical miles of such a station, a transformer input exceeding $\frac{1}{2}$ kw., except for sending signals of distress, or signals or radiograms relating thereto.

Intercommunication.

11. Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station, during the hours it is in operation, to listen-in at intervals of not less than fifteen minutes, and for a period not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

Division of Time.

12. At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the forgoing regulations concerning wavelengths and character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce may, on the recommendation of the department concerned, designate the station or stations which may be required to observe this division of time.

Government Stations to Observe Division of Time.

13. The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

Use of Unnecessary Power.

14. In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

General Restrictions on Private Stations.

15. No private or commercial station not engaged in the transaction of bona fide commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding 1 kw., except by special authority of the Secretary of Commerce contained in the licence of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

Special Restrictions in the Vicinities of Government Stations.

16. No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding $\frac{1}{2}$ kw.

Ship Stations to Communicate with Nearest Shore Stations.

17. In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

Limitations for Future Installations in Vicinities of Government Stations.

18. No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations, to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin Convention of 1906, and future International Conventions or treaties to which the United States may be a party, at each of the stations above referred to, and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin Convention of 1906 and future International Conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

Secrecy of Messages.

19. No person or persons engaged in or having knowledge of the operation of any station or stations, shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punished by a fine of not more than two

hundred and fifty dollars or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the court.

Penalties.

For violation of any of these regulations, subject to which a licence under sections 1 and 2 of this Act may be issued, the owner of the apparatus shall be liable to a penalty of one hundred dollars, which may be reduced or remitted by the Secretary of Commerce and for repeated violations of any of such regulations the licence may be revoked.

For violation of any of these regulations, except as provided in regulation 19, subject to which a licence under section 3 of this Act may be issued, the operator shall be subject to a penalty of twenty-five dollars, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any such regulations, the licence shall be suspended or revoked.

SEC. 5.—That every licence granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon conviction thereof the owner or operator, or both, shall be punishable by a fine of not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio-communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit, or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than two thousand five hundred dollars or imprisonment for not more than five years, or both, in the discretion of the court for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than one thousand dollars or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

SEC. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act, and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this Act shall apply to apparatus for radio communication on any foreign ship.

SEC. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

SEC. 10.—That this Act shall not apply to the Philippine Islands.

SEC. 11.—That this Act shall take effect and be in force on and after four months from its passage.

D REGULATIONS GOVERNING SHIP AND LAND RADIO STATIONS.

SHIP STATIONS.

1. On vessels coming under the Ship Acts, an emergency power supply, independent of the vessel's main electric power plant, must be provided which will enable radio messages to be sent for at least four hours over a distance of at least 100 miles day or night. The emergency power supply and equipment should be located and installed in such manner as to afford maximum protection against accident.

2. The radio transmitting apparatus operated from the emergency power supply, should be capable of functioning within two minutes after unexpected notice to the operator.

3. The complete equipment must be maintained in an efficient condition at sea.

4. The complete emergency equipment should be tested before each sailing and daily at sea by the operator or an inspector and a note of its performance entered in the radio log.

5. Radio inspectors or other duly authorised officers of the Government will occasionally call for test messages to be sent by means of the emergency apparatus, while the vessel is at sea.

6. An "induction coil" connected to "plain aerial" is not recommended as emergency apparatus on account of the high voltages produced which frequently damage the antenna insulation and on account of "vibrator troubles."

7. A motor generator or rotary converter operated by storage battery is probably the most satisfactory means available at present of energising the transmitting apparatus.

8. Any auxiliary engine for wireless purposes must operate on a fuel which will fulfil the requirements of Rule XI, section 5, of the General Rules and Regulations of the Steamboat Inspection Service, reading as follows:

None of the inflammable articles specified in section 4472, Revised Statutes, or oil that will not stand a fire test of 300° F. shall be used as stores on any pleasure steamer or steamer carrying passengers except that vessels not carrying passengers for hire may transport gasoline or any of the products of petroleum for use as a source of motive power for motor boats or launches of such vessels (Sec. 4472, R.S.)

9. Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

10. One extra pair of head telephones, extra cords, and extra detectors must always be kept on hand.

11. A storage battery voltmeter, hydrometer, a supply of electrolyte, and distilled water should be part of the regular equipment, but are not prescribed in terms by statute. The absence of these and similar inexpensive emergency articles will be brought to the attention of the master and of the company installing the apparatus by the radio inspector, in writing, and if after a reasonable interval

they have not been supplied, the inspector will communicate the fact to the Commissioner of Navigation.

12. The vessel's electric power for the operation of the main equipment shall, at all times while the steamer is under way, be available for the radio operator's use. On steamers where the dynamo is not run continuously there should be an efficient means of communication between the radio room and the dynamo room, in order that the radio operator may signal for power, as the law provides that he may not leave his post of duty.

13. Efficient communication between the radio room and the bridge must be maintained. A speaking tube or telephone will comply with this requirement. A bell and messenger service will not be acceptable unless there are special conditions justifying this equipment. The speaking tube or telephone must terminate in the radioroom and on the bridge, or in the chart room if readily accessible from the bridge. If the radio room is adjacent to or accessible from the bridge so that orders may be transferred direct, no means of communication will be required. Any arrangement calling for the services of a third person to transmit the messages will not be satisfactory. The radio inspectors will notify the ship authorities whether the means of communication provided is satisfactory at the time of inspection.

14. On vessels of the United States it is the statutory duty of the master to see that one operator is on duty at all times. The radio service of the ship is under the supreme authority of the master.

15. Masters should require operators on duty to communicate with the officer on the bridge every half-hour.

16. Operators must make entries on the radio log every fifteen minutes, as evidence that a continuous watch is being maintained. The entries must, if possible, consist of the call letters of other stations communicating and a few words of the intercepted messages.

17. When vessels are in port the key to the radio room must at all times be on board in charge of the proper officer and the radio equipment shall be in such condition as to facilitate Government inspection.

CLASSIFICATION OF SHIP STATIONS AND GRADES OF OPERATORS REQUIRED.

18. First Class: Vessels having a continuous service. There shall be placed in the first-class vessels which are intended to carry twenty-five or more passengers:

(1) If they have an average speed in service of fifteen knots or more.

(2) If they have average speed in service of more than thirteen knots, but only subject to the two-fold condition that they have on board 200 persons or more (passengers and crew), and that, in the course of their voyage, they go to a distance of more than 500 sea miles between any two consecutive ports.

19. Second Class: Vessels having a continuous watch but a service of limited duration. Other vessels placed in the second-class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

20. Third Class: Vessels which have no fixed periods of service. All vessels which are placed neither in the first nor in the second-class shall be placed in the third-class.

21. Service may be defined as preparedness to transmit and receive radio messages or

signals at the rate of at least twenty words per minute.

22. *Watch* may be defined as preparedness to receive distress signals and call letters slowly. A "watcher" or cargo-grade operator will summon a first or second-class operator is necessary.

23. All American vessels required by the Act of July 23rd, 1912, to be equipped with radio apparatus, and operators *must* at all hours maintain a continuous *watch*; that is to say, an operator or *watcher* must be "listening-in" continuously. This requirement is outside of and above the requirement based on the classification under which the ship's station is licensed.

24. Vessels voluntarily equipped are not required to maintain this continuous *watch*. Vessels voluntarily equipped are, however, subject to the following requirements as to *watch* according to the class assigned to them in their station licences.

25. If a licence of the second class be issued to a voluntarily equipped vessel, the station *must* maintain a continuous *watch* for at least seven hours a day and a *watch* of ten minutes at the beginning of every hour.

26. The grade of operators required on vessels of each class are prescribed in the London Convention Service Regulations, Article X. A continuous *watch* may be maintained by one commercial second-grade operator and one cargo-grade operator on cargo steamers.

27. Passenger vessels coming under the Act of July 23rd, 1912, which carry or are licensed to carry twenty-five or more passengers, *must* be placed in the first class:

(a) If they have an average speed in service of fifteen knots or more.

(b) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board 200 persons or more (passengers and crew); and that in the course of their voyage they go a distance of more than 500 sea miles between any two consecutive ports.

The *service* shall be carried on by at least two commercial first-grade operators.

28. Cargo vessels coming under the Act of July 23rd, 1912, which are required to maintain a continuous *watch*, *must* be placed in the second class if continuous *service* is not maintained. On cargo steamers a continuous *watch* may be maintained by at least one commercial second-grade operator and one cargo-grade operator.

29. Passenger vessels coming under the Act of July 23rd, 1912, but which are not required to be entered in the first class, *may* be entered in the first or second class, according to whether continuous *service* or continuous *watch* is maintained. The number and grade of operators required is determined by *service* or *watch*. On passenger vessels coming under the Ship Act but entered in the second class at least two second-grade operators are required to maintain continuous *watch*.

30. Cargo vessels which coming under the Act of July 23rd, 1912, and are required to maintain a continuous *watch*, *may* be placed in the first class, if continuous *service* is maintained. (For operators, see par. 28.)

31. All vessels voluntarily equipped with radio apparatus and which have no specified hours of *service* or *watch* must be placed in the third class.

32. Any vessel voluntarily equipped may be placed in the first class if continuous *service*

is maintained, or in the second class if a continuous *watch*, or a watch of limited duration, such as specified above for vessels of the second class is maintained.

33. In all ship stations transmissions shall be made only by operators holding commercial first or second grade licences or higher.

34. Commercial *service* shall be maintained by not lower than commercial first-grade operators.

35. Vessels which are voluntarily equipped with radio apparatus for their own convenience and for the correspondence of officers and crew must employ at least one commercial second-grade operator or higher.

36. Radio telephone apparatus on vessels not coming under the Act of July 23rd, 1912, must be operated by a person holding a cargo-grade licence or higher.

37. The owners of ship stations desiring to change the classification of a ship must apply for a new licence.

LAND-STATIONS.

38. Coast stations are stations which transmit messages to vessels at sea or on the Great Lakes, or whose operations can interfere with the exchange of messages between ship and ship or ship and coast. The principal purpose of the regulation of radio communication, international and national, is to secure the greatest efficiency of maritime communication through this agency especially as a means of promoting safety to life.

39. Inland stations are stations which cannot transmit messages to vessels at sea or on the Great Lakes and whose operations cannot affect the transmission of messages between ship and ship or ship and coast. This may be due to their geographical location or to their range, dependent on power and aerial, or conditions. In some instances actual inspection may be necessary to determine whether a station should be licensed as a coast station or an inland station. An operator or owner in doubt as to the classification of his station should communicate the facts to the radio inspector of his district when applying for a licence.

40. Stations are bound to give absolute priority to calls of distress from ships, to similarly answer such calls, and to take such action with regard thereto as may be required.

41. The working of stations shall be organised as far as possible in such manner as not to disturb the service of other stations.

42. All coast stations (par. 38), excepting general and restricted amateur stations, are required to be able to transmit on the wavelengths of 300 and 600 metres for the purpose of transmitting or relaying distress messages or signals and messages relating thereto, if necessary.

43. Coast stations primarily intended for long waves and long-distance transmission may install an auxiliary antenna and auxiliary transmitter to comply with the short wavelength requirements.

44. The international standard wavelength is 600 metres, and the operators of all coast stations are required, during the hours the station is in operation, to "listen-in" at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiving apparatus tuned to receive this wavelength, for the purpose of determining if any distress signals or messages are being sent and to determine if the transmitting

operations of the "listening stations" are causing interference with other radio communication.

45. General public service may be defined as "paid business," conducted on commercial wavelengths between ship and shore or ship and ship.

46. Limited public service may be defined as "paid business" between certain designated land stations, ships or lines of ships, and must be conducted on some authorised wavelength other than 300 or 600 metres.

47. All special service must be conducted on some authorised wavelength other than 300 or 600 metres, not interfering with general public service.

48. Limited commercial, special amateur, and all stations which have no authorised rates, shall not transmit or accept public correspondence from other stations, except in case of emergency.

49. If a general public-service coast station also maintains a limited commercial service with other stations on land or with vessels at sea, the limited commercial service must be conducted on some authorised wavelength other than 300 or 600 metres, but this service can be authorised on a general public-service coast station licence without stating the specific hours, it being understood that the limited commercial service is conducted only when no general public service business is on file.

50. If a general public-service coast station also maintains a public service between fixed points on land, the service between the and stations must be conducted on some authorised wavelength other than 300 or 600 metres, and a separate form, No. 761, should be submitted covering "Limited public service," giving the exact hours of such service.

CLASSIFICATION OF LAND STATIONS AND GRADES OF OPERATORS REQUIRED.

51. Both coast stations (the word "coast stations," "shore stations," and "coastal stations" are used interchangeably) and inland stations are divided for the purposes of the administration of the Act into the following classes:

- (1) Public-service stations—
 - (a) General.
 - (b) Limited.
- (2) Limited commercial stations.
- (3) Experiment stations for the development of radio communication.
- (4) Technical and training school station.
- (5) Special amateur stations.
- (6) General amateur stations.
- (7) Restricted amateur stations.

52. CLASS 1.—(a) *Public Service stations, general*, are those open to general business between coast and ships and include those operated by common carriers under the Act of February 4th, 1887, to regulate commerce, amended June 18th, 1910. They are required to maintain a constant service when open. Every coastal station open to public service shall at all times be ready to receive messages of such wavelengths as are required by the International Convention in force. (Sec. 4, Regulation 1, Act of August 13th, 1912.) The station rates are authorised in the licence and published in the Official Berne List. Whenever such stations do not insure a constant service, transmitting and receiving day and night without interruption, the Secretary of the Navy is directed to open naval radio stations within 100 miles thereof to public

business. (Sec. 4, Regulation 18, Act of August 13th, 1912.) The Secretary of War is authorised by the Act of May 26th, 1900 (31 Stat., 206), to open Alaskan military stations to public service.

53. General public service shall be conducted only by operators holding commercial first-grade licences or higher.

54. CLASS 1.—(b) *Public-service stations, limited*, are reserved for a limited public service, determined by the object of the correspondence or other circumstances independent of the system employed. Stations of this class transmit and receive public messages to and from certain stations only, which are designated in the licence. The rates are authorised in the licences, and if not published in the official list they may be obtained from the licensee.

55. The service of limited public service coast stations shall be carried on by commercial first-grade operators or higher.

56. The service of limited public service inland stations shall be carried on by commercial second-grade operators or higher.

57. CLASS 2.—*Limited commercial stations* are not open to public service and are licensed for a specific commercial service or services defined in the licence. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorised.

Licences of this class are required for all transmitting radio stations used for broadcasting news, music, lectures, church services, Government reports, and such matters, and do not permit the transmission of private or commercial communications.

The reading of telegrams or letters by broadcasting stations will not be construed as point-to-point communication so long as the signer is not addressed in person and so long as the text matter is of general interest.

Broadcasting stations must be operated by or under the supervision of an operator holding a commercial second-class licence or higher; such operator must be on duty during the entire time the station is being operated.

No testing or experimenting is authorised in broadcasting stations between the hours of 10 a.m. and midnight, local standard time.

Broadcasting stations the operation of which interfere with the reception of time signals and meteorological information by marine service must remain silent while such signals are being transmitted.

Class A radiotelephone broadcasting stations.

Class A radiotelephone broadcasting station licences will be issued to stations equipped to use power not exceeding 500 watts in the antenna and will be assigned a wavelength between 222 metres (1,350 kilocycles) and 300 metres (1,000 kilocycles). Where more than one station of this class are licensed in the same city or locality, a division of time will be required, if necessary.

Class B radiotelephone broadcasting stations.

A licence will not be issued for a station in this class which does not comply in every respect with the specifications hereunder.

Specifications covering the requirements governing the construction, licensing, operating, and service of class B radiotelephone broadcasting stations.

Station.

Wavelength.—The wavelengths between 300 and 345 and 375 and 545 metres only will be assigned for the use of stations of this class, which must be free from harmonics. Whenever necessary,

the use of a coupled circuit transmitter will be required. Hereafter but one wavelength within these ranges, including the 400 metres wavelength, will be assigned to any one locality.

Power.—The power supply must be dependable and non-fluctuating. The minimum required will be 500 watts in the antenna and the maximum shall not exceed 1,000 watts in the antenna.

Modulation.—The system must be so arranged as to cause the generated radio frequency to vary accurately according to the sound impressed upon the microphone system.

Spare parts.—Sufficient tubes and other material must be readily available to insure continuity and reliability of the announced schedule of service.

Antenna.—The antenna must be so constructed as to prevent swinging.

Signalling system.—Some adequate and dependable system must be provided for communication between the operating room and the studio.

Studio.—The radio equipment in the studio must be limited to that essential for use in the room. The room shall be so arranged as to avoid sound reverberation and to exclude external and unnecessary noises.

Service.

Programs.—The programs must be carefully supervised and maintained to insure satisfactory service to the public.

Music.—The use of mechanically operated musical instruments is prohibited.

Division of time.—Where two or more stations of class B are licensed in the same city or locality, a division of time will be required, if necessary.

Forfeiture of Class B privilege.

Licences issued for the use of the wavelengths between 300 and 345 metres and 375 and 545 metres shall specifically provide that any failure to maintain the standards prescribed for such stations may result in the forfeiture of the class B privilege and relicensing of the station to use a wavelength below 300 metres.

Class C radiotelephone broadcasting stations.

All radiotelephone broadcasting stations now licensed to use 360 metres (834 kilocycles) are placed in this class. No new licences will be issued for stations to use this wavelength. Renewal licences for the use of 360 metres will be granted if desired.

REGULATIONS FOR BROADCASTING STATIONS.

The department has accepted the recommendations of the Second National Radio Conference, and immediate steps will be taken to put the plan into effect as far as found practicable.

The United States is divided into five zones with separate wavelengths designated for certain localities in each zone.

It is proposed to put the reallocation of wavelengths plan into effect at noon, May 15, 1923.

Radio inspectors will notify the owners of all licensed class B stations of the wavelength assigned for their locality under the new plan and advise those stations of this class who are not on 360 metres to make provisions to use the new wavelength at the time specified. The new wavelength must not be used for broadcasting prior to the date indicated. The use of the 400-metre wavelength will not be permitted after May 15, 1923, except by the station to which this specific wavelength is assigned under the new plan.

Hereafter all Government reports will be sent on the wavelength assigned to the station, and the exclusive use of the 485-metre wavelength will be discontinued for this service.

Stations now licensed to use 360 metres (now placed in class C) have the privilege of transferring to class A and using a wavelength between 222 and 300 metres, which will be designated by the radio inspector, or, if they can qualify, transferring to class B and using the wavelength designated for that locality within the band between 300 and 345 metres and 375 and 545 metres.

Where two or more stations of one class operate in the same city or locality a division of time will be required, if necessary.

VIOLATION OF ACT OF AUGUST 13, 1912, BY BROADCASTING STATIONS.

Under the reallocation of wavelengths plan effective May 15, 1923, it will be necessary for all transmitting radio stations to be accurately adjusted to the wavelength specified in the licence. Any variation from this rule may be considered a violation of section 2, Act of August 13, 1912, justifying the revocation or suspension of the station licence.

Beginning May 15, radio inspectors of each district will carefully check the transmitting wavelengths of stations in their districts by personal inspection of the stations as far as practicable and by listening in with accurately calibrated receivers and report to the department promptly any discrepancies observed.

The Bureau of Standards will transmit standard wavelengths from time to time which will be helpful in determining accurate wavelengths and will also listen-in and check the wavelengths being used.

58. If a coast station, the operators shall hold a commercial second-grade licence or higher. (Par. 57.)

59. CLASS 3. — *Experimental stations.* — The Secretary of Commerce is authorised by section 4 of the Act to grant special temporary licences "to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power on any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations." Applicants for such licences should state any technical result they have already produced, their technical attainments, etc. The fact that an applicant desires to experiment with his equipment does not justify or require a licence of this class. Most experiments can be made within the limitations of general and restricted amateur station licences or by use of an artificial antenna to prevent radiation.

60. Experiment stations may be operated by a person holding an experiment and instruction grade licence or higher.

61. CLASS 4. — *Technical and training-school stations* will be licensed, according to the degree of technical training attained and imparted and to local conditions.

62. The grade of operators required will be specified when the licence is issued.

63. CLASS 5. — *Special amateur stations* may be licensed by the Secretary of Commerce to use a longer wavelength and a higher power on special application. Applications for this class from amateurs with less than two years' experience in actual radio communication will not be approved. The application must state the experience and purpose of the

applicant, the local conditions of radio communication, especially of maritime radio communication in the vicinity of the station, and a special licence will be granted only if some substantial benefit to the art or to commerce apart from individual amusement seems probable. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

64. Special amateur *coast* stations must be operated by a person holding a commercial second-grade licence or higher. Inland stations may be operated by persons holding amateur second-grade licences or higher.

65. CLASS 6.—*General amateur stations* are restricted to a transmitting wavelength not exceeding 200 metres and a transformer input not exceeding 1 kw. (Sec. 4, Regulation 15, Act of August, 13th, 1912.)

66. CLASS 7.—*Restricted amateur stations*, within five nautical miles of a naval or military station, are restricted to a wavelength not exceeding 200 metres and to a transformer input not exceeding $\frac{1}{2}$ kw. (Sec. 4, Regulation 16, Act of August 13th, 1912.)

67. Amateur first or second grade operators or higher are required for general and restricted amateur stations:

68. The licence does not specify the number of operators required, but provides that the station shall at all times while in operation be under the care of an operator licensed for that purpose. The grade and number of operators as required by law is determined by the service of the station.

69. *Special stations for exceptional distances* are land stations designed to carry on trans-oceanic radio communication as between the United States and European countries, or between the Pacific coast and Hawaii, or from the United States over similar long distances at sea to another land station, or (inland) to carry on radio communication overland over exceptional distances. These stations will all come under one of the classifications named above and the licence will indicate the stations for which communication is authorised and indicate the range.

REGULATIONS COMMON TO LAND AND SHIP STATIONS.

70. Any change in the characteristics of the radio apparatus or service of the station must be authorised by the Secretary of Commerce.

71. Every land and ship station open to general public service shall have, as a part of the station equipment, a copy of the Official Berne List of Radiotelegraph Stations and supplements thereto, as issued to comply with section 2 of the Act of July 24th, 1910. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

72. The service regulations of the London Convention, Article VII, paragraphs 1 and 2b, require a reduction of power or range under certain conditions. A proper resistance, impedance coil, or reactance regulator in the primary circuit is recommended. In certain cases the reduction of voltage or decreasing of coupling may be approved upon recommendations of radio inspectors.

73. Persons or corporations holding licences for radio stations, either land or ship, if practicable, must submit the licence to the radio inspector for the district, whenever the station or vessel goes out of commission for a period exceeding three months. The Commissioner of Navigation should be notified promptly of any

intention to suspend or discontinue the service of any commercial station.

74. If there is no intention to resume the same service or if the station or vessel will enter a different service from that indicated by the licence, the radio inspector will submit the licence to the Bureau, together with a statement of the facts. Otherwise the radio inspector may retain the licence in his files for safe keeping until the date of its expiration, when it will be forwarded to the Bureau for cancellation.

75. When the station goes into commission the owner may apply to the radio inspector for the return of the licence. The radio inspector will satisfy himself that the station corresponds to the schedule of the station as shown in the licence, and if so, the licence will be returned.

76. Stations desiring to conduct tests should communicate with the radio inspector by letter or telephone, stating the probable length of time that will be required. Stations conducting such tests or temporary experiments should "listen-in," to determine that no interference is being caused, and during the tests should "listen-in" frequently for the interference signal, "QRM." Stations conducting tests should transmit their official call signal frequently. Attention is invited to the Act of August 13th, 1912, section 5:

That every licence granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon a conviction thereof the owner or operator, or both, shall be punishable by a fine not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

77. The Department holds that interference caused by tests of the character described above (par. 76) as "wilful" when no "listening-in" precautions are taken and the call signal of the station sending is not repeated at intervals.

APPLICATIONS FOR SHIP AND LAND STATION LICENCES, RENEWALS, AND DUPLICATES.

78. The Act does not apply either afloat or ashore to—

(a) Apparatus for radio communication which merely receives radiotelegrams and is not equipped for sending.

(b) Apparatus for the transmission of radiograms exclusively between points in the same State, if the effect of such transmission does not extend beyond the State (so as to interfere with the radio communication of other States), or if the effect of such transmission does not interfere with the reception of radiograms from beyond the State (so as to interfere with the interstate radio communication of that State).

(c) Apparatus for radio communication which has been issued to the Organised Militia by the War Department or to the Naval Militia by the Navy Department and is used for official purposes only.

79. The owner or operator of any apparatus who may be in doubt whether his apparatus under this paragraph is exempt from licence may write the facts to the radio inspector for his district before applying for a licence.

80. The apparatus for transmission of radiograms, or signals on any vessel of the United

States not permanently moored, requires a licence.

81. Apparatus for radio communication on land within the jurisdiction of the United States (excluding the Philippine Islands and excluding apparatus of the Government of the United States) must be licenced if—

(a) The apparatus is a means of commercial intercourse among the several States or with foreign nations; or

(b) The apparatus transmits radiograms or signals the effect of which at any time extends beyond the State; or

(c) The apparatus interferes with the receipt of messages in any State from beyond such State.

82. Station licences for the use and operation of apparatus for radio communication under the Act may be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory of the United States or Porto Rico.

83. Licences can be issued to clubs if they are incorporated or if a member will accept the responsibility for the operation of the apparatus, carrying with it the possibility of being penalised for infraction of the laws.

84. Application for station licences of all classes should be addressed to the United States Radio Inspector for the district in which the station is located, who will forward the necessary blank-forms and information. The limits of the districts and addresses of radio inspectors are given on page 68, paragraph 166.

85. Upon receipt of the forms, properly completed, the radio inspector will make a thorough inspection of the station if practicable.

86. When applications and forms have been properly submitted, ship and amateur stations may be operated in accordance with the laws and regulations governing the class of station for which application for licence has been made, until such time as the application can be acted upon, unless the applicant is otherwise instructed and provided temporary official call letters are assigned.

87. General and restricted amateur-station licences are issued directly by radio inspectors. Station licences of all other classes are issued from the office of the Commissioner of Navigation, Department of Commerce. Applications and forms are forwarded by radio inspectors and recommendations by them.

88. Stations desiring to operate different portions of the day under different classifications shall submit application for each service, giving exact hours for each. If approved, each classification will be specified in the licence.

89. The owner of an amateur station may operate his station in accordance with the laws if his application for a licence has been properly filed, but has not been acted upon. An application for an operator's licence must also have been filed, and every effort made to obtain the licence before the station may be operated.

90. "Provisional" station licences are issued to amateurs remote from the headquarters of the radio inspector of the district in which the station is located. These licences are issued as a matter of convenience and record. If, under inspection, the station is found to comply with the law, the inspector will strike out the word "Provisional" and insert the date of inspection and his signature at the bottom of the licence.

91. If such a station is found not to comply with the law the provisional licence may be cancelled until such time as the apparatus is readjusted to meet the requirements of the law: *Provided, however, That* consideration will be given to any reports of interference filed against such a station.

92. All persons are warned that it is unlawful to operate stations after licences have expired unless application for renewal has been properly made.

93. Owners desiring to renew licences must complete new forms as prescribed for original applications. Amateur-station licences issued on current forms may be renewed by the following endorsement on the back, provided no changes in the equipment or location have been made: otherwise a new licence will be issued: "This licence renewed for one year.

Radio Inspector." The Commissioner of Navigation will be notified of the name and call signal in every case of renewal in this manner.

94. Any person applying for a duplicate licence to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector of the district, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate licence or a duplicate will be forwarded through the inspector's office.

95. A duplicate licence will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

REGULATIONS GOVERNING RADIO OPERATORS.

CLASSES, GRADES AND REQUIREMENTS.

E 96. (1) Commercial extra first grade; (2) commercial first grade; (3) commercial second grade; (4) commercial cargo grade; (5) commercial temporary permit; (6) experiment and instruction grade; (7) amateur first-grade; (8) amateur second grade.

97. The Service Regulations of the International Convention require that "the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject."

98. Such certificates shall attest the professional efficiency of the operator as regards—

(a) Adjustment of the apparatus and knowledge of its functioning;

(b) Transmission and acoustic reception at the rate of not less than twenty words a minute (Continental Morse) for commercial first-grade operators and not less than twelve words per minute for second-grade operators;

(c) Knowledge of the regulations governing the exchange of wireless telegraph correspondence.

(d) The certificate shall furthermore state that the Government has bound the operator to secrecy with regard to the correspondence.

99. The International Convention has been ratified by the principal maritime nations, dominions and provinces. Radio operators holding valid certificates issued by foreign Governments which are parties to the convention will be recognised by this department as persons "skilled in the use of such apparatus" within the meaning of the Act,

unless in the case of a specific individual there may be special reason to doubt the operator's skill and reliability. Such certificates should be ready at hand for the inspection of radio inspectors or customs officers before the steamer departs from the United States.

100. In the case of a vessel subject to the Act under the flag of any nation not a party to the International Convention, the radio operator, before the departure of the vessel from the United States, must furnish to the inspector evidence that he is "skilled in the use of the apparatus." This evidence shall consist of an examination on board by the radio inspector.

101. *Commercial extra first class.*—The Department of Commerce will issue a special licence, to be known as commercial extra first grade, to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition.

102. These licences will be given consideration by the Civil Service Commission in examination for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations.

103. Applicants for the commercial extra first-grade licence must pass a special examination. To be eligible for this examination they must hold commercial first-grade licences, and their certificates of skill in radio communication, issued under the Act of June 24th, 1910, or licences under the Act of August 13th, 1912, must record eighteen months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by endorsement on the licence service records, or other satisfactory evidence, and provided that the applicants have not been penalised for a violation of the radio laws and regulations.

104. A speed of at least thirty words per minute Continental Morse, and twenty-five words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

105. All examination papers, including the code test sheets, will be marked and forwarded to the Commissioner of Navigation, with a recommendation by the radio inspector or examining officer. Examination papers will be marked upon the basis of 100, and licences will be recommended only if eighty or better is attained.

106. Licences of this grade will be issued by the Commissioner of Navigation, endorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

107. *Commercial first class.*—The applicant must pass a satisfactory examination in—

(a) The adjustment, operation, and care of the apparatus, including correction of faults and change from one wavelength to another.

(b) Transmitting and receiving by ear at a speed of not less than twenty words a minute in Continental Morse (five letters to the word).

(c) Use and care of storage battery or other auxiliary power apparatus.

(d) Knowledge of the international regulations in force applying to radio communication.

(e) Knowledge of the requirements of the Acts of Congress to regulate radio communication (secs. 3, 4, 5, 6, and 7 of the Act of August 13th, 1912).

108. The commercial extra first grade and the commercial first grade licences qualify holders for employment at any ship or land station of any class.

109. *Commercial second class.*—The applicant must pass a satisfactory examination in all the subjects prescribed above for the first grade, with the exception that the minimum speed in transmitting and receiving shall not be less than twelve words a minute in Continental Morse, and the examination in the subjects will not be as comprehensive as that given first-grade operators.

110. *Commercial cargo grade.*—Section 2 of the Act of July 23rd, 1912, provides: "On cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life."

111. The examination will be conducted so as to determine the following facts:

(a) That the applicant is sufficiently familiar with the Continental Morse Code to recognise the distress signal (SOS) when included in a list of other words or signals sent slowly (approximately five words a minute).

(b) That the applicant is sufficiently familiar with the Continental Morse Code to recognise radio call letters of the vessel on which he desires to operate when sent slowly and repeated several times.

(c) That the applicant is sufficiently familiar with the type of the receiving apparatus of the vessel on which he desires to operate to determine by buzzer or similar test that the detector or receiving apparatus is properly adjusted to receive signals.

112. Examining officers and radio inspectors are authorised to issue a certificate, in the form of an amateur first-grade licence, after examination, to indicate the facts above enumerated in the case of a member of the crew or other person, and experience under this form will be credited by examining officers if the holder later applies for examination for a commercial licence. These licences will be marked "Cargo" in the upper right-hand corner under the serial number.

113. *Commercial temporary permit.*—Section 3 of the Act of August 13th, 1912, provides: "In case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a licence, to the operator on a vessel subject to the Radio Ship Act of June 24th, 1910."

114. The temporary permit, in the form of a letter to the operator, is to be issued only in cases of emergency and will be valid for one voyage from to beginning, unless the proper licence or properly licensed operator can be obtained en route.

115. The permits should be issued only to persons who the collector of customs has reason to believe are skilled in the use of the apparatus, but have not had the opportunity to present themselves for examination before

Government officers authorised to conduct examinations and furnish licences.

116. The collector of customs will forward to the Department of Commerce (Bureau of Navigation) a report covering each temporary permit issued and the reasons for its issue.

117. *Experiment and instruction grade.*—Experimenters and instructors of scientific attainments in the art of radio communication whose knowledge of the radio laws satisfies the radio inspector or the examining officer may obtain this grade licence, provided they are able to transmit and receive in the Continental Morse Code at a speed sufficient to enable them to recognise distress calls or the "keep-out" signals.

118. The operator's licence for this grade is a commercial licence, endorsed by the Secretary of Commerce with a statement of the special purpose for which it is valid.

119. If the applicant qualifies, the radio inspector or examining officer will forward the papers to the Commissioner of Navigation, with his recommendation. If approved, the licence will be properly endorsed by the Secretary of Commerce and delivered to the licensee through the recommending officer.

120. This licence has no reference to the instruction of radio operators as such, but is required by those operating apparatus licensed as experimental stations but who are unable to obtain commercial grade operators' licences.

121. Amateurs before applying for licences should read and understand the essential parts of the International Radiotelegraphic Convention in force and sections 3, 4, 5, and 7 of the Act of August 13th, 1912. The Department recognises that radio communication offers a wholesome form of instructive recreation for amateurs. At the same time its use for this purpose must observe strictly the rights of others to the uninterrupted use of apparatus for important public and commercial purposes. The Department will not knowingly issue a licence to an amateur who does not recognise and will not obey this principle. To this end the intelligent reading of the International Convention and the Act of Congress is prescribed as the first step to be taken by amateurs. A copy of the radio laws and regulations may be procured for this purpose from the radio inspectors or from the Commissioner of Navigation, Department of Commerce, Washington, D.C., but they are not for public distribution. Additional copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

MISCELLANEOUS.

June 28th, 1923.

General and restricted amateur radio station licences will be issued permitting the use of any type of transmitter (CW, spark, AC-CW, ICW, unfiltered CW, and phone), with the restriction that when using pure CW they are authorised to use wavelengths from 150 to 200 metres, and when using spark, AC-CW, ICW, unfiltered CW, and phone the wavelengths from 176 to 200 metres only can be used. The types of transmitters must be specified in the application and the licence. Special amateur radio station licences will be issued permitting the use of pure continuous wave transmitter only, authorising the use of wavelengths from 150 to 220 metres.

For the purpose of application to amateur stations pure CW is defined, as follows: A system of telegraphing by continuous oscillations in which the power supply is substantially direct

current as obtained from (1) a generator, (2) a battery, or (3) a rectifier with an adequate filter. (A filter is not deemed adequate if the supply modulation exceeds 5 per cent.) General restricted and special amateur stations are not permitted to use a transformer input exceeding 1 kilowatt, or equivalent of this power based upon watt input to plates if tubes are used. (Where input rating of tube is not specified by manufacturer this rating will be considered as double the manufacturers' output rating.)

On licences issued for amateur stations you will include the following: "This station is not licensed to transmit between the hours of 8 and 10.30 p.m., local standard time, nor Sunday mornings during local church services." Special amateur stations must be operated by persons holding an extra first-grade amateur operator's licence, or a commercial first-class operator's licence, or a commercial extra first-class operator's licence. Applicants must also meet the requirements of Regulation 63.

A new class of amateur operator's licence is hereby established to be known as "Amateur extra first grade." Licences of this grade will be issued to persons passing the required special examination with percentage of at least 75 and code speed in sending and receiving at least 20 words a minute, five characters to the word, who have had at least two years' experience as a licensed radio operator, and who have not been penalised for violation of the radio laws subsequent to the date of these regulations.

A. J. TYRER, *Acting Commissioner.*

Approved—

S. B. DAVIS, *Acting Secretary of Commerce.*

122. *Amateur first grade.*—The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the International Convention and Acts of Congress in so far as they relate to interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive in Continental Morse at a speed sufficient to enable him to recognise distress calls or the official "keep-out" signals. A speed of at least ten words per minute (five letters to the word) must be attained.

123. *Amateur second grade.*—The requirements for the second grade will be the same as for the first grade. The second-grade licence will be issued only where an applicant cannot be personally examined or until he can be examined. An examining officer or radio inspector is authorised in his discretion to waive an actual examination of an applicant for an amateur licence, if the amateur for adequate reasons cannot present himself for examination but in writing can satisfy the examining officer or radio inspector that he is qualified to hold a licence and will conform to its obligations.

EXAMINATIONS.

124. The following requirements and method of conducting examination for radio operators' licences will be adopted at all examining offices.

125. The test shall consist of messages with call letters and regular preambles, conventional signals and abbreviations and odd phrases, and shall in no case consist of simple, connected reading matter. The test will be conducted by means of the omnigraph or other automatic instrument wherever possible.

126. The test shall continue for five minutes at a speed of twenty words, twelve words and ten words per minute, respectively, for the commercial first, second, and lower grades, and to qualify the applicant must receive twenty, twelve, or ten words in consecutive order.

127. The code test sheets written by the applicant will be forwarded to the Commissioner of Navigation with other papers and the speed attained noted in the lower left-hand corner of the first sheet.

128. An applicant will be given credit for the maximum speed he can attain.

129. The practical and theoretical examination shall consist of seven comprehensive questions under the following headings and values:

	Points, maximum value.
(a) Experience	20
(b) Diagram of receiving and transmitting apparatus	10
(c) Knowledge of transmitting apparatus	20
(d) Knowledge of receiving apparatus	20
(e) Knowledge of operation and care of storage batteries	10
(f) Knowledge of motors and generators	10
(g) Knowledge of international regulations governing radio communication and the United States radio laws and regulations	10
	100

130. Seventy-five constitutes a passing mark for the first-grade commercial. Sixty-five constitutes a passing mark for the second-grade commercial.

131. Applicants who fail to attain twenty words in the code test but who attain a mark of between sixty-five and seventy-five in the written examination may be issued second-class licences, if they can receive at least twelve words per minute.

132. Question (a) shall determine the applicant's practical knowledge and experience in handling radio apparatus. An applicant's experience will be determined largely from the personal question sheet, and from satisfactory letters or references submitted. Experience, operating first-class amateur apparatus, or the apparatus provided in good training schools, will be given a reasonable value, but applicants who have had experience as apprentices at commercial shore stations or on board vessels will receive higher marks.

133. No applicant who fails to qualify will be re-examined at any examining office within three months from date of the previous examination. All examination papers, whether the applicant qualifies or not, will be forwarded to the Bureau of Navigation for filing as "Operator's record." When the records of the Bureau develop the fact that an applicant has failed to qualify and has applied for re-examination or been re-examined at the same or another office within three months, his existing licence may be suspended or revoked by the Secretary of Commerce. Applicants to whom are issued second-grade licences will not be examined for first-grade within three months under the same rule.

PLACES WHERE EXAMINATIONS ARE HELD.

134. (Excised.)

135. Naval radio stations: San Juan, P.R.; Colon, R.P.; Honolulu, H.T.

136. United States Army stations: Fort St. Michael, Alaska; Fort Valdez, Alaska.

137. Bureau of Navigation, Department of Commerce, Washington, D.C.

138. Radio inspectors, at their offices and elsewhere, by special arrangement.

139. Additional opportunities for taking the examination will be afforded as may be deemed necessary, and these special dates and places may be ascertained by communication with the Commissioner of Navigation, or nearest radio inspector.

140. All licences, when awarded, will be delivered through the officer who conducted the examination.

141. Examinations for the commercial extra first-grade licences will be held at the following offices only by appointment.

142. (Excised.)

143. United States radio inspectors, custom-houses: New Orleans, La.; San Francisco, Cal.; Seattle, Wash.; Chicago, Ill.; Boston, Mass.; New York, N.Y.; Baltimore, Md.; Detroit, Mich.; Norfolk, Va.

144. Commissioner of Navigation, Department of Commerce, Washington, D.C.

145. In special cases, upon application to the Commissioner of Navigation, arrangements may be made for examinations at other points.

APPLICATIONS FOR EXAMINATIONS FOR RADIO OPERATORS' LICENCES, RENEWALS, AND DUPLICATES.

146. An operator's licence may be granted to any person without regard to sex, nationality or age if the applicant can fulfil the requirements for the class of licence desired.

147. Applicants for licences should communicate in writing with the commandants, commanding officers, or officers in charge at navy yards, and army posts, with the Commissioner of Navigation, or radio inspectors, in order to fix the date when they can be examined. (See pars. 134-145.)

148. Commercial licences can only be obtained by personal examination. Where applicants are at remote points or cannot proceed to examining offices, efforts will be made to examine them through radio inspectors when they are in that vicinity, but special trips cannot be made for that purpose.

149. Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 (application for operator's licence) and to the radio inspector in their vicinity for Form 762 (application for licence for land station). If the application for operator's licence is also made to the radio inspector, both applications should be forwarded in the same envelope.

150. Amateur operators at points remote from examining offices and radio inspectors may be issued second-grade amateur licences without personal examination. Examinations for first-grade licences will be given by the radio inspector when he is in that vicinity, but special trips cannot be made for this purpose (see par. 123).

151. Persons holding radio operator's licences, amateur second grade, should make every effort to appear at one of the examination points to take the examination for amateur first-grade licence or higher.

152. Persons holding radio operator's licence of any class or grade should, before their licences expire, apply to the nearest radio inspector or examining officer for renewal and submit Form 756 in duplicate.

153. Radio operators of the commercial class or cargo grade whose licences show on the service records satisfactory service for three months out of the last six months of the licence term may be issued new licences without re-examination. Other operators who submit satisfactory evidence to the examining officer, showing actual operations of radio apparatus for three months during the last six months of the licence term, may be issued new licences without re-examination. All others will be re-examined in the usual manner.

154. Whether or not a new licence is issued, the radio inspector or examining officer will forward one copy of Form 756, properly completed, to the Commissioner of Navigation, Department of Commerce. If a new licence is not issued, the reason therefor will be stated on the back of the form.

155. Any operator applying for a duplicate licence to replace an original which has been lost, mutilated, or destroyed, will be required to submit an affidavit to the Bureau of Navigation through the radio inspector or examining officer who issued the original, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate licence. A duplicate licence will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

156. Operators' licences are not valid until the oath for the preservation of the secrecy of messages is properly executed before a notary public or other officer duly authorised to administer oaths. Licences must indicate on their faces that the oath has been taken and the officer administering the oath on the back of the licence should sign also in the blank provided on the face.

157. Operators' licences should be framed and posted in the radio room, and licences for stations should be accessible at all times to inspectors.

158. Under the supervision of a licensed operator an apprentice or unlicensed person may learn the art by the actual use of the apparatus, but the licensed operator who fails to enforce obedience to the regulations by the apprentice or unlicensed person serving under his supervision is liable to penalties as if he had himself violated the regulations.

159. An individual record is kept in the Bureau of Navigation, Department of Commerce, at Washington, of each licensed operator. Each operator's examination papers and all reports in regard to interference or violations of the radio laws and regulations are filed for reference.

160. Radio operators holding licences of any grade or class and applying for examination for any other grade or class must submit to the examining officer Form 756, in duplicate. If a new licence is issued the licence held by the applicant must be surrendered.

161. Radio operators who pass the examination for a higher class or grade licence are required to surrender their existing licences; which will be forwarded to the Commissioner of Navigation with the other papers.

162. Operators desiring to retain their expired or cancelled licences may make application therefor to the Commissioner of Navigation.

GENERAL INFORMATION.

ADMINISTRATION AND ADMINISTRATIVE DISTRICTS.

F 163. The Department has established, for the purpose of enforcing, through radio inspectors and others, the acts relating to radio communication and the International Convention, the following districts, with the principal office for each district at the custom house of the port named.

164. Communications for radio inspectors should be addressed as follows, and not to individuals: Radio Inspector, Customhouse, (city), (State),

165. Communications for the Bureau of Navigation should be addressed as follows, and not to individuals: Commissioner of Navigation, Department of Commerce, Washington, D.C.

166. (1) BOSTON, MASS.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

(2) NEW YORK, N.Y.: New York (county of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (Counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth, Hudson, and Ocean).

(3) BALTIMORE, MD.: New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, all counties south of the Blue Mountains, and Franklin County), Delaware, Maryland, Virginia, District of Columbia.

(4) SAVANNAH, GA.: North Carolina, South Carolina, Georgia, Florida, Porto Rico.

(5) NEW ORLEANS, LA.: Alabama, Mississippi, Louisiana, Texas, Tennessee, Arkansas, Oklahoma, New Mexico.

(6) SAN FRANCISCO, CAL.: California, Hawaii, Nevada, Utah, Arizona.

(7) SEATTLE, WASH.: Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

(8) DETROIT, MICH.: New York (all counties not included in second district), Pennsylvania (all counties not included in third district), West Virginia, Ohio, Michigan (Lower Peninsula).

(9) CHICAGO, ILL.: Indiana, Illinois, Wisconsin, Michigan (Upper Peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

REPORTING OF VIOLATIONS.

167. The regulations established by law, or by the authority of law, or of the International Convention, will be enforced by the Secretary of Commerce through collectors of customs, radio inspectors, and other officers of the Government.

168. The service regulations of the radio-telegraphic Convention in force provide that "no station on shipboard shall be established or worked by private enterprise without authority from the Government to which the vessel is subject." Such authority shall be in the nature of a licence issued by said Government. Stations on foreign ships will be licensed by their Governments respectively. Inspectors will report to the Commissioner of Navigation stations on foreign ships not so licensed.

169. A radio inspector is authorised in exceptional cases to act outside of his district for the convenience of commerce. In such cases he will communicate before or after acting with the inspector in whose district he has acted. Radio inspectors are authorised to

communicate directly with collectors of customs and to co-operate with them in the enforcement of the law.

170. Violations of the laws and regulations will be reported to the chief customs officer of the district in which the offence occurs, who will report the case to the Secretary of Commerce (Bureau of Navigation), according to the procedure followed in violations of the navigation laws. Misdemeanours will be reported to the United States district attorney in the usual manner.

171. Collectors of customs and radio inspectors are enjoined that the reports required by paragraph 170 must be precise statements of the facts as the basis for possible proceedings by the United States attorney.

172. Violations by the master of a vessel of the United States of the provisions of the second paragraph of section 1 of the ship act will be reported to the collector of customs directly, and the usual procedure in cases of fines and penalties will be followed.

INSPECTION OF SHIP STATIONS.

173. The radio inspectors and customs officers, as far as practicable shall visit steamers subject to the act before they leave port and ascertain if they are equipped with the apparatus in charge of the operators prescribed by law and regulation.

174. When the radio apparatus is certified as complying with the requirements of law by the competent authorities of a foreign Government, such certificate will be recognised by this Department, but the radio inspector or customs officer may, if he deem it necessary or desirable, satisfy himself that the apparatus is in good working order.

175. Whenever practicable the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of July 23rd, 1912, that the apparatus is efficient and in good working order within the meaning of the Act, and if satisfied he shall issue a certificate in the form of Appendix A (form 752). The duplicate of these certificates will be filed with the collector of customs as a record of the radio equipment on vessels sailing from his port.

176. These certificates will be issued only if the inspection is made within two hours of sailing time.

177. For each clearance the master of a steamer coming under the Act of July 23rd, 1912, is required to furnish to the customs officer a certificate in the form in Appendix B (Form 753). Such certificate shall be retained in the files of the collector of customs. Whenever the radio inspector is absent from his home port he will notify the collector of customs, who will arrange for the collection of certificates and survey of equipment.

178. When a steamer subject to the radio law is without the apparatus and the operators prescribed, or either of them, and is about to attempt to leave port, the radio inspector or customs officer visiting the vessel shall:

(a) Furnish the master with a memorandum (stub of Form 771) of the particulars in respect of which the law has not been complied with and the penalty;

(b) If convenient, notify the vessel's agents or the proper person in charge of the apparatus so that the necessary corrections may be made before sailing.

179. If a steamer clears in violation of the law the radio inspector or customs officer shall submit to the collector of customs of the port a written report, stating the exact nature

of the violation, the section of the law violated, and the penalties involved and all of the circumstances in connection therewith which will be of service to the collector and to the Secretary of Commerce in determining what action shall be taken. A copy of the report will be forwarded to the Commissioner of Navigation.

180. Statements should be obtained from operators, ships officers, or other witnesses at the time the violation is discovered and should accompany the report to the collector of customs.

181. The collector of customs will report the case to the Secretary of Commerce in the usual manner as a navigation fine case.

182. Merchant vessels chartered by the United States Government are subject to the Act of August 13th, 1912, in every case, if the radio apparatus is owned and operated by a commercial company.

183. Merchant vessels chartered by the United States Government for the transportation of persons or supplies are subject to the requirements of the ship act (Act of July 23rd, 1912), if the vessel is controlled and operated by the owners. Vessels commanded wholly or in part by Government officers are not subject to the ship act.

184. Government vessels or vessels chartered by the Government are subject to the act of August 13th, 1912, if the radio equipment is owned and operated by private interests.

185. The ship act does not authorise the refusal of clearance in case of violation of its provisions, but specifically provides for the imposition of a fine in a sum not more than \$5,000.

186. The act does not apply to a vessel at the time of entering a port of the United States. Radio inspectors and customs officers may, however, accept as evidence of the efficiency of the operators and the skill of an operator messages shown to have been transmitted and received by him over a distance of at least 100 miles, by day, during the voyage to the United States.

OPERATORS ON FOREIGN VESSELS.

187. In so far as licensed operators are concerned a sharp distinction should be drawn between the Act of July 23rd, 1912, which requires apparatus and operators for radio communication on steamers and the Act of August 13th, 1912, to regulate radio communication.

188. The Act of July 23rd, 1912, amending the Act of June 24th, 1910, is designed to promote safety at sea through the employment of apparatus and operators to transmit and receive distress calls and other calls relating to perils and aids to navigation. It provides that in the case of American and foreign vessels subject to its provisions "the radio equipment must be in charge of two or more persons skilled in the use of such apparatus." This Act does not require that the operators shall be licensed, and the penalty prescribed in section 3 of the Act is not incurred by the master of a vessel whose operators are "skilled in the use of such apparatus," even though they may not be licensed.

189. The Act of August 13th, 1912, is designed to execute on behalf of the United States the International Radiotelegraphic Convention and thus to promote orderly exchanges by radio communication. For this purpose the International Radiotelegraphic Convention (Service Regulations) provides that the service of the station on shipboard shall be carried on by a telegraph operator

holding a certificate issued by the Government to which the vessel is subject.

190. Section 3 of the Act of August 13th, 1912, carries out this provision of the International Convention by providing licences for operators on American vessels. If an unlicensed person serves in charge or in supervision of the use and operation of the apparatus both he and his employer are liable to a fine of not more than \$100 or imprisonment for not more than two months or both. This section and penalty do not apply to operators on foreign ships. But operators on the ships of foreign nations signatory to the International Radiotelegraphic Convention, as shown above, are required to have certificates or licences from their own Governments, and if not so certificated, the obligations of the convention have not been observed. The convention in the Service Regulations provides for this situation.

191. The Act of July 23rd, 1912, as stated, requires that on American and foreign ships the operators must be "skilled in the use of such apparatus," but does not require that they must be licensed. To facilitate commerce and simplify administration, operators presenting American licences or foreign certificates are accepted as "skilled in the use of such apparatus," except where there may be special reasons to doubt the operator's skill or reliability. Where operators on American or foreign ships do not have such licences or foreign certificates, radio inspectors or customs officers under the Act of July 23rd, 1912, may accept other competent evidence of skill or may examine such operators.

OFFICIAL INTERNATIONAL LIST OF COAST AND SHIP RADIO STATIONS OF THE WORLD AND STATION RATES.

192. The list of land and ship stations of the United States including amateurs, giving call letters, wavelengths, nature of service, etc. can be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

193. Supplements to this list are issued monthly and the list is revised annually, as of July 1st. Information concerning amateur stations will not be included in the supplements, but in the annual edition only.

194. The introduction to the list of "Radio Stations of the United States" contains information concerning the assignment of international and amateur call letters.

195. A copy of the Official Berne List, and supplements as issued, are required as a part of the equipment of every station open to general public service.

196. The International List of Radio Stations of the World (edition in English) can be procured from the International Bureau of the Telegraphic Union (Radiotelegraphic Service), Berne, Switzerland.

197. In addition to the information contained in the pamphlet of the United States stations, published by the Bureau of Navigation, the international list shows geographical locations, normal ranges in nautical miles, radio systems and rates.

198. The international list includes the Government and commercial land and ship stations of the United States. The list is divided into three parts. The first part contains a list of ship stations, grouped by countries and arranged alphabetically; the

second part contains a list of land stations arranged in the same manner; and the third part contains tables of land line and cable charges from coast radio stations to inland and various other points. In computing the total word rate applicable to a radiogram from a ship station to an inland point or *vice versa*, the three rates must be added. The rates in the international list are stated in francs. For approximate purposes 1 franc equals 20 cents and 5 centimes equals 1 cent. Supplements to the international list will be issued monthly, and will contain new stations and tables of alterations.

199. The International Alphabetical List of Call Letters (stations of the world) is also issued by the international bureau at Berne, and supplements will be issued monthly.

200. Neither the international list proper nor the supplements will contain a list of amateur stations.

201. Inquiries as to the subscription price of these lists should be made direct to the Berne bureau, at the address given above, (See par. 196.) Remittances to Berne should be made by international postal money order.

MISCELLANEOUS INFORMATION.

202. Stations equipped to receive only do not require licences.

203. Operators of receiving stations do not require licences, but *all persons* are required to maintain secrecy in regard to messages, as provided in the Act of August 13th, 1912, nineteenth regulation of section 4.

204. Distances under the radio laws are computed in nautical miles.

205. No fees are charged for any operator or station licence.

206. Licensed stations must be operated by or under the direct supervision of properly licensed operators.

207. Amateur stations within five miles of naval or military stations need not have been in actual operation on or before August 13th, 1912, to obtain a licence for a restricted amateur station.

208. The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radio telegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of such censorship nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

209. The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

210. No person shall transmit or make a signal containing profane or obscene words or language.

211. Additional or amendatory regulations will be issued from time to time as they may appear necessary.

Radio Service Form 752.

CERTIFICATE OF RADIO INSPECTION.

PORT OF

19

G This is to certify that I have to-day examined the apparatus for radio communication on the s.s.

of which is master, about to leave this port for and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Radio Inspector.

(Or)

Customs Inspector.

Radio Service Form 753.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

NOTICE.

H The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regarded by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators and watches, shall subject him to a penalty of one hundred dollars. (Act of July 23rd, 1912.)

PORT OF

19

This is to certify that I have to-day examined the apparatus for radio communication on the S.S., of which I am master, about to leave this port for and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Master.

No.

RADIO SERVICE FORM 753A
RADIO DECLARATION.

(To be submitted in duplicate.)

I NOTICE—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars."—Act of July 23rd, 1912.

Port of

Date....., 19..

This is to certify that the (nationality) s.s. of the (name of company or line) of which I am master, entered this port on 19.. having in crew (number) persons

and licensed or certificated to carry (number) passengers; that the said vessel (is/is not) * equipped with radio apparatus as required by the Act of June 24th, 1910, as amended July 23rd, 1912; that the radio station is in charge of (number) properly licensed radio operators and the apparatus is

Master or Agent.

in efficient/inefficient † condition.

This form should be filed in duplicate with the Collector of Customs at time of entry, who will furnish one copy to the radio inspector of the district on the date of entry in order that proper inspection may be made of the radio apparatus prior to the clearance of the vessel.

RADIO FORM 753B.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

J NOTICE—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars."—Act of July 23rd, 1912.

CLEARANCE.

Port of

19..

This is to certify that I have to-day examined the apparatus for radio communication on the (nationality) s.s.

of which I am master, about to leave this port for and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Master.

LICENCE FOR GENERAL PUBLIC
SERVICE COAST RADIO STATION.
DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

K Pursuant to the Act, to regulate radio communication, approved August 13th, 1912, a citizen of the

State of

..... a company incorporated under the laws of the State of having applied therefor, is hereby granted by the Secretary of Commerce for a period of and subject to the restrictions and conditions hereinafter stated and revocable for cause

* Strike out *is* or *is not* as the case may be.† Strike out *efficient* or *inefficient* as the case may be.

by him this licence to use or operate the apparatus for radio communication (identified in the schedule hereinafter) located in the State of _____ city or town of _____, for the purpose of transmitting to and receiving from stations and other land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the international agreement to which the government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and the citizens thereof, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States."

3. The authority conferred by this licence is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to regulate commerce," as amended by the Act of June 18th, 1910, so far as the licence may be within the operation of said Act, and except as provided in the Act of August 13th 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station during the hours of operation shall listen-in at intervals of not less than 15 minutes and for a period of not less than two minutes with the receiver tuned to receive messages of 300 metres wavelength.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other commercial station and with any ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Twelfth Regulation by the Act of August 13th, 1912.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Location: State, _____, County _____; City or Town, _____
Street, _____; No. _____
Geographical location: Latitude, N. ° ' " _____
Longitude, W. ° ' " _____
Specific hours authorised during which the station must be open to service (local standard time): _____
Power: Transformer input, _____ kw.
Normal day range in nautical miles with ships at sea _____
Time and method, if any, of sending time signals and hydrographic and meteorological radiograms: _____
Call letters _____
_____ ; Coast charges : per word _____
minimum per radiogram _____
_____ ; Coast charges : per word _____
minimum per radiogram _____
_____ ; Coast charges : per word _____
minimum per radiogram _____
Radiotelegraphic system employed _____
Characteristics of transmitting system :
Type of spark gap, _____
Approximate spark frequency, _____
Characteristics of receiving system :
Type of receiver, _____
Wavelength of receiving system: From _____ metres to _____ metres.
Antenna : Number of masts, _____ ; Height, _____
_____, _____, _____

Type of aerial,
 Wires: Number,; Size and
 kind,
 Essential dimensions,

Sending wave-length.*	Antennacurrent (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

* Underscore normal.

The station insures rapid exchange with
 land wire stations of the

(Company.)

(Location telegraph office.)

(Company.)

(Location telegraph office.)

in the following manner:.....

Satisfactory proof has been furnished that
 the station was actually operating August 13th,
 1912.

This licence will expire on the.....
 day of....., 19..

Secretary of Commerce.

Commissioner of Navigation.

Washington, D.C.....19....

INSPECTIONS.

Date.	Inspector.	Remarks.

WAVELENGTHS.

The normal sending and receiving wave-length shall be metres, and no other wavelength shall be used for general public correspondence with any foreign ship or foreign coast station, except for long-range public service or purposes other than general public correspondence.

The station shall at all times, except as provided in the seventh paragraph of this licence, be ready to receive messages of such wavelengths as are required by the International Radiotelegraphic Convention; shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions on the receiver shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

No.

LICENCE FOR SHIP RADIO STATION.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

L Pursuant to the Act to regulate
 radio communication, approved August
 13th, 1912

a citizen of the State of

For long-range public service and for any
 service other than general public correspondence
 the station is authorised to use the following
 additional wavelength under 600 or over
 1,600 metres:

Metres,; Metres,; Metres,
 Metres,; Metres,

The energy, if radiated by the transmitter in
 two or more wavelengths as indicated by a
 sensitive wavemeter, shall not in any one of
 the lesser waves exceed 10 per cent. of that
 in the greatest; and the logarithmic decrement
 per complete oscillation in the wave trains
 shall not exceed two-tenths, except when
 sending signals or messages relating to vessels
 in distress.

.....
 a company incorporated under the laws of the
 State of, having applied
 therefor, is hereby granted by the Secretary
 of Commerce for a period of
 on and subject to the restrictions and con-
 ditions hereinafter stated and revocable for
 cause by him, this licence to use or operate
 the apparatus for radio communication
 (identified in the schedule hereinafter) on the
 called..

(Type of vessel.)

....., vessel of the....
 (Name of vessel.)

United States, official number for
 the purpose of transmitting to and receiving
 from other ship stations and land stations
 general public correspondence, Government
 and service correspondence, and distress
 signals and messages, at rates of compensation
 not in excess of those fixed by the International
 Agreement to which the Government of the
 United States has adhered, which have been
 submitted to and approved by the Secretary
 of Commerce, as included in the schedule
 hereinafter.

2. The use or operation of apparatus for
 radio communication pursuant to this licence
 shall be subject also to the articles and regu-
 lations established by the International Radio-
 telegraphic Convention, ratified by the Senate
 of the United States and caused to be made
 public by the President "to the end that the
 same and every article and clause thereof may
 be observed and fulfilled with good faith by the
 United States and citizens thereof," and shall
 be subject also to such regulations as may be
 established from time to time by authority
 of subsequent acts and treaties of the United
 States.

3. The authority conferred by this licence is
 subject to the provisions of the act of February
 4th, 1887, entitled "An Act to Regulate
 Commerce," as amended by the Act of June
 18th, 1910, so far as the licensee may be within
 the operation of said Act, and except as pro-
 vided in the Act of August 13th, 1912, or in
 the International Radiotelegraphic Conven-
 tion and regulations made part thereof, the
 station shall transmit all messages offered by
 those who tender lawful rates on equal terms

without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, except when in case of emergency the Collector of Customs by authority of the Secretary of Commerce shall issue a temporary permit, in lieu of a licence, to the operator. The operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station shall be prepared to send the international signal of distress and distress signals on the normal wavelength designated by the International Radiotelegraphic Convention in force with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a ship station equipped with apparatus for sending and receiving equal in all essential particulars to the apparatus of the station herein licensed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use, except for sending signals of distress or signals and radiograms relating thereto, or when, owing to unusual circumstances, communication can be established only by means of an increase of power, a transformer input exceeding 1 kW., or exceeding $\frac{1}{2}$ kW. when within five nautical miles of a naval or military station.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Ship: Name,; Owner,; Home port,; International Code letters,
 Radio call letters:
 Nature of service:
 Hours of operation:
 Power: Transformer input,kW.
 Primary source of power,
 Normal day range in nautical miles with other ships at sea,
 Ship charge: Per word,; Minimum per radiogram,
 Per word,; Minimum per radiogram,
 Radiotelegraphic system employed:
 Characteristics of transmitting system:
 Type of spark gap,
 Approximate spark frequency,
 Characteristics of receiving system:
 Type of receiver,
 Wavelength range of receiving system:
 From metres to metres
 Antenna: Number of masts,
 Height,
 Type of aerial,
 Wires: Number,; Size and kind,
 Essential dimensions,
 Auxiliary apparatus: Type,
 Power: Source,; Normal day range with ships,

Sending wavelength.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		

*Underscore normal.

WAVELENGTHS.

The normal sending and receiving wavelength shall be 600 metres, and the station shall be prepared to use two sending wavelengths, one of 600 metres and one of 300 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

A wavelength of metres and the following additional wavelengths not exceeding 600 metres may be employed as authorised by law and treaty:

Metres,; Metres,; Metres,
 Metres,; Metres,; Metres,
 Metres,; Metres,

The energy if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels

in distress and in sending distress signals when the transmitter may be tuned to create a maximum of interference with a maximum of radiation.

The station in general shall transmit its radiograms to the nearest coast station. The sender shall have the right, however, to designate the coast station through which he desires to have his radiograms transmitted, and his wishes shall be complied with only if the transmission can be effected without interfering with the service of other stations, or the shipboard station shall wait until such coast station shall be the nearest as provided by the International Convention in force.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This licence will expire on the day of 19

[SEAL.] Secretary of Commerce.
Commissioner of Navigation.
Washington, D.C., 19

INSPECTIONS.

Date.	Inspector.	Remarks.

No.

LICENCE FOR LAND RADIO STATION.

Class

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

M Pursuant to the Act to regulate radio communication, approved August 13th, 1912, a citizen of the State of a company incorporated under the laws of the State of , having applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this licence to use or operate the apparatus for radio communication (identified in the schedule hereinafter) for the purpose of transmitting to and receiving from ship stations and other land stations public correspondence, Government and service correspondence, and distress signals and messages at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter, or for the purpose of conducting experiments for the development of the science of radio communication or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations, the purpose of the station being designated by the classification at the head of this licence.

2. Public correspondence or limited commercial correspondence authorised by this licence shall be limited to certain stations, ships or lines of ships named hereinafter, which designation is authorised in view of the nature of the service and is independent of the radio system employed.

3. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent Acts and treaties of the United States, in so far as they apply to the class of station indicated by this licence.

4. The authority conferred by this licence is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

5. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

6. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

7. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall not use a transmitter during the first fifteen minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Regulation 12 of the Act of August 13th, 1912.

10. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

11. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

12. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Name of owner
Location: State,; County,; City or town,; Street,; No.

Geographical location: Latitude, N. ...° ...' ..."; Longitude, W. ...° ...' ..."

This station is licensed for communication only with the following land stations, ships, or lines of ships:

Specific hours during which the station must/may be open to service (local standard time):

Power: Transformer input, kW.
Normal day range in nautical miles,
Time and method, if any, of sending time signals and hydrographic and meteorological radiograms:

Call letters,; Coast charges: per word; minimum per radiogram; Coast charges: per word; minimum per radiogram; Coast charges: per word; minimum per radiogram

Radiotelegraphic system employed,
Characteristics of transmitting system:

Type of spark gap,
Approximate spark frequency,

Wavelength range of receiving system: From metres to metres.

Antenna: Number of masts, Height,,,

Type of aerial, Wires: Number,; Size and kind,

Essential dimensions,

WAVELENGTHS.

The normal sending and receiving wavelength shall be metres.

If the station be classified as a coast station, it shall be prepared to transmit or relay distress calls or messages using the distress wavelength as provided by the International Radiotelegraphic Convention in force.

In view of special conditions the station is authorised to use for communication exclusively with stations licensed by the United States the

following additional wavelengths under 600 or over 1,600 metres:

Metres,; Metres,; Metres,; Metres,

The energy, if radiated by the transmitter in two or more wavelengths indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

The station insures rapid exchange with land wire stations at

(Company.)

(Location telegraph office.)

Sending-wave-length.	Antenna current (amperes).	Logarithmic decrement.
300 metres		
600 metres		
metres		
metres		
metres		

(Company.)

(Location telegraph office.)

in the following manner:

This licence will expire on the day of, 19..

[SEAL OF DEPARTMENT OF COMMERCE.]

Secretary of Commerce.
Commission of Navigation.
Washington, D.C., 19..

INSPECTIONS.

Date.	Inspector.	Remarks.

Form 765a. ORIGINAL.

Official Call..... Number.....

LICENCE FOR SPECIAL AMATEUR RADIO STATION.

DEPARTMENT OF COMMERCE—BUREAU OF NAVIGATION—RADIO SERVICE.

N Pursuant to the Act to regulate radio communication, approved August 13th, 1912,, a citizen of the State of county of city or town street No. having applied therefor, is hereby granted by the Secretary of Commerce, for a period of year, on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this licence to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said

station is located: *Provided*, That no interference other than may result under the restrictions contained in this licence shall be caused with the radio communication of stations of the Government of the United States or licensed stations.

2. The use or operation of apparatus for radio communication pursuant to this licence shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States, and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the tube input shall not exceed 1,000 watts.

6. The station shall not use a transmitting wavelength exceeding 220 metres.*

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the Act of August 13th, 1912.

8. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector, or other duly authorised officer of the Government.

Name of naval or military station, if within five nautical miles.....

Power: Tube Output..... W.

Antenna: Type (T, J, etc.).....

Height.....
(Above ground.)

* On account of the trouble caused by amateurs transmitting on the same wavelengths as those used for broadcasting concerts, the Government has limited the wavelengths which may be used by amateur experimenters to 150 to 200 metres for pure C.W., and 176 to 200 metres for chopped C.W. or damped waves. A special licence will be granted to amateurs holding an extra first-class certificate and having at least two years' experience, or to those holding commercial radiotelegraphists licences, whereby they will be privileged to use wavelengths of 150 to 220 metres.

Horizontal length.....

Wires: Number in vertical part.....

In Horizontal part.....

The sending wavelengths shall be 150 to 220 metres and the station is authorised to use any wavelength within this band.

This Licence expires on....., 192..

HERBERT HOOVER,

D. B. CARSON, *Secretary of Commerce.*
Commissioner of Navigation.

Delivered by.....

Supervisor of Radio.

Place.....

Date....., 192..

THE UNITED STATES OF AMERICA.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

LICENCE TO RADIO OPERATOR, COMMERCIAL EXTRA FIRST CLASS.

O This is to certify that
has been examined and passed,
pursuant to the Radiotelegraphic
Convention, in

(a) Adjustment, operation and care of
apparatus;

(b) Transmitting and sound reading at a
speed of words a minute,
Continental Morse, and words
a minute, American Morse;

(c) Use and care of storage battery or
other auxiliary;

(d) Knowledge of international regulations
and Acts of Congress to regulate radio
communication;

(e) Knowledge of United States Naval
Radio Regulations;

and is hereby licensed, as required by law,
Radio Operator, Commercial Extra First
Grade, for two years.

In testimony of trustworthiness and efficient
service as Radio Operator for
months, of which months were
service at sea, and of superior knowledge
and skill, ascertained by special examination
this extra grade licence is granted.

..... Oath of Secrecy executed.
(Examining Officer.)

.....
Secretary of Commerce.

.....
(Title) *Notary Public.*

.....
Commissioner of Navigation.

Place..... Date..... 19..
This licence is not valid until the following
oath has been executed:—

I, do solemnly
swear that I will faithfully preserve the secrecy
of all messages coming to my knowledge through
my employment under this licence; that this
obligation is taken freely without mental
reservation or purpose of evasion, and that
I will well and faithfully discharge the duties
of the office: So help me God.

.....
(Signature of holder.)

Date of birth,

Place of birth,

Sworn to and subscribed before me this.....

day of..... A.D. 19....

.....
Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this
licence has served satisfactorily as radio operator
under my orders during the period named.

Name of Ship or Land Station.	Period	Master, Manager, or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on the backs of their licence properly completed and signed by the master of their ship or their employer.

No.
THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
LICENCE TO RADIO OPERATOR,
COMMERCIAL* CLASS.
GRADE.

This is to certify that
P has been examined and passed pursuant to the Radiotelegraphic Convention, in
(a) Adjustment, operation and care of apparatus;
(b) Transmitting and sound reading at a speed of not less than † words a minute, Continental Morse;
(c) Use and care of storage battery or other auxiliary;
(d) Knowledge of international regulations and Acts of Congress to regulate radio communication;
and is hereby licensed as required by law a Radio Operator, Commercial* grade for two years. The candidate's practical knowledge of adjustment was tested on a set of apparatus. His knowledge of other systems is shown below.

.....
HERBERT HOOVER,
Secretary of Commerce.

..... Oath of Secrecy executed.
(Examining Officer.)

E. T. CHAMBERLAIN,
Commissioner of Navigation.

.....
(Title.) Notary Public.

Place..... Date..... 19..

This licence is not valid until the following oath has been executed:—

I,.....do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this licence; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

(Signature of holder.)

Date of birth.....
Place of birth.....
Sworn to and subscribed before me this.....
day of..... A.D. 19....

Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this licence has served as radio operator under my orders during the period named.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

Operators must have the service record on the backs of their licence properly completed and signed by the master of their ship or their employer.

No.
THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
LICENCE TO RADIO OPERATOR,
AMATEUR FIRST GRADE.

Q This is to certify that
has been examined and shown to have a knowledge of the adjustment and operation and of the regulations of the Radio telegraphic Convention and the Acts of Con-

gress in so far as they relate to interference with radio communication and impose certain duties on all grades of operators sufficient to entitle him to a licence, and he is hereby licensed as required by law Radio Operator, Amateur First Grade for two years.

The candidate was examined and shown to have knowledge (excellent or good) in the following additional subjects:

(a) General adjustment, operation and care of apparatus †.....
(b) Transmitting and sound reading Continental Morse at a speed of § words a minute

(c) General knowledge of international regulations and Acts of Congress to regulate

* First or Second. † Twenty or Twelve

*Excellent or good. † Insert speed.

radio communication †
 Oath of Secrecy executed,
 (Examining Officer.)

(Title.) Notary Public.

Place....., Date..... 19....
 HERBERT HOOVER,
 Secretary of Commerce.
 E. T. CHAMBERLAIN,
 Commissioner of Navigation.

This licence is not valid until the following
 oath has been executed :—

Ido solemnly
 swear that I will faithfully preserve the secrecy
 of all messages coming to my knowledge through
 my employment under this licence; that this

obligation is taken freely without mental
 reservation or purpose of evasion, and that
 I will well and faithfully discharge the duties
 of the office: So help me God.

(Signature of holder.)

Date of birth.....
 Place of birth.....
 Sworn to and subscribed before me this.....
 day of..... A.D. 19....

Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this
 licence has served as radio operator under my
 orders during the period named.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....
.....	From, 19.., to, 19..	.....

* Operators must have the service record on
 the back of their licence properly completed
 and signed by the master of their ship or their
 employer.

No.
 THE UNITED STATES OF AMERICA.
 DEPARTMENT OF COMMERCE.
 BUREAU OF NAVIGATION.
 RADIO SERVICE.

LICENCE TO RADIO OPERATOR,
 AMATEUR SECOND GRADE.

R This is to certify that
 has presented satisfactory evidence
 that he has a knowledge of the ad-
 justment and operation of apparatus and of
 the regulations of the Radiotelegraphic
 Convention and the Acts of Congress, in so far
 as they relate to interference with radio com-
 munication and impose certain duties on all
 grades of operators, sufficient to entitle him
 to a licence, and he is hereby temporarily
 licensed as RADIO OPERATOR, AMATEUR SECOND
 GRADE, for the period of eight months or until
 he has been duly examined.

He has shown that he has knowledge
 (excellent or good) of the following additional
 subjects:

(a) General adjustment, operation, and
 care of apparatus.....
 (Excellent or good.)

(b) Transmitting and sound reading
 Continental Morse at a speed of
 words a minute.

(c) General knowledge of international
 regulations and Acts of Congress to regulate
 radio communication.....
 (Excellent or good.)

..... Oath of Secrecy executed
 (Certifying Officer.)

(Title.) Notary Public.

Place....., Date....., 19....
 HERBERT HOOVER,
 Secretary of Commerce.
 E. T. CHAMBERLAIN,
 Commissioner of Navigation,

Ido solemnly
 swear that I will faithfully preserve the secrecy
 of all messages coming to my knowledge through
 my operations under this licence; that this
 obligation is taken freely, without mental
 reservation or purpose of evasion; and that
 I will well and faithfully observe the obligation
 of a licensed radio operator: So help me God.

(Signature of holder.)

Date of birth.....
 Place of birth.....
 Sworn to and subscribed before me this.....
 day of..... A.D. 19..

Notary Public

SEAL.

NOTICE TO BERNE BUREAU

S The Minister of Marine of the United
 States of America has notified to
 the Berne Bureau that the following
 information is to be published :—

1. The Departments of the United States
 Government which are concerned with wireless
 telegraphy regret that they have not yet been
 able to make arrangements with the land
 telegraph of the United States owing to the
 fact that these are in the hands of commercial
 companies, and have nothing to do with the
 Government. The idea was to arrange for
 the free transmission over the land telegraph,
 in accordance with Article 14, paragraph 2,
 of the Rules of Service of the London Con-
 vention. The information to be transmitted
 free of charge was all such as related to the
 date and the hour of the handing in of radio-
 telegrams on board ship. But the transmission
 of such information over land lines being sub-
 ject to a tax, the Government of the United
 States cannot, at present, conform strictly to
 this rule of the Convention. The declaration
 of the American delegation contained in Article 2
 of the Final Protocol made provision for such
 a possible outcome, although its exact nature
 was not actually set forth.

2. Multiple radiotelegrams, such as are
 mentioned in article 38, paragraph 5, of the

Rules of Service, will be accepted as multiple messages in all wireless transmission between ship and shore stations, but all the companies operating land telegraph lines in the United States will consider, and will charge for, a multiple wireless message as consisting of so many individual telegrams as the addresses it bears may indicate.

3. The United States is not a member of the International Telegraphic Union and consequently is not bound to execute the rules laid down in Article 38, paragraph 8, of the London Convention Rules of Service concerning urgent radiotelegrams. The laws of the United States regulating all reciprocal arrangements between the States forbid the use of the privilege, and consequently all telegraph companies will not allow any priority in favour of telegrams for which any additional tax may have been paid.

T An Act to authorise the President of the United States to arrange and participate in an international conference to consider questions relating to international communication.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, requested and authorised in the name of the Government of the United States to call, in his discretion, an international conference to assemble in Washington, and to appoint, by and with the advice and consent of the Senate, representatives to participate therein, to consider all international aspects of communication by telegraph, telephone, cable, wireless telephone, and wireless telegraphy, and to make recommendations with a view to providing the entire world with adequate facilities for international communication on a fair and equitable basis.

SEC. 2.—That the sum of \$75,000, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, the same to be disbursed under the direction and in the discretion of the Secretary of State for expenses incidental to the conference, including personal services in the District of Columbia notwithstanding the provisions of any other Act: Provided, That no part of said sum shall be used in entertainment or for the purchase of medals and badges.

Approved, December 17th, 1919.

U.S. RADIO COMPASS STATIONS.

U (See under U.S.A. in Direction Finding Section.)

PUBLIC RESOLUTION.

NO. 48—67TH CONGRESS.

[H. J. Res. 7.]

V Joint Resolution to authorise the operation of Government-owned Radio Stations for the use of the general public, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled: That all land, ship and airship radio stations, and all apparatus therein owned by the United States may be used by it for receiving and transmitting messages relating to Government business, compass reports and the safety of ships.

SEC. 2. That the Secretary of the Navy is hereby authorised, under the terms and conditions and at rates prescribed by him, which rates shall be just and reasonable, and which, upon complaint, shall be subject to review and revision by the Interstate Commerce Commission, to use all radio stations and apparatus, wherever located, owned by the United States and under the control of the Navy Department—(a) for the reception and transmission of press messages offered by any newspaper published in the United States, its Territories or possessions, or published by citizens of the United States, in foreign countries, or by any press association of the United States, and—(b) for the reception and transmission of private commercial messages: *Provided*, That the rates fixed for the reception and transmission of all such messages, other than press messages between the Pacific coast of the United States, Hawaii, Alaska, and the Orient, shall not be less than the rates charged by privately owned and operated stations for like messages and service: *Provided further*, That the right to use such stations for any of the purposes named in this section, except for the reception and transmission of press messages, other than press messages between the Atlantic coast of the United States and ships at sea, shall terminate and cease as between any countries or localities or between any locality and privately operated ships, whenever privately owned and operated stations are capable of meeting the normal communication requirements between such countries or localities or between any locality and privately operated ships, and the Secretary of Commerce shall have notified the Secretary of the Navy thereof, and all rights conferred by this section shall terminate and cease on June 30th, 1925, except that all such rights conferred by this section in the Republic of China shall terminate and cease on January 1st, 1924.

Approved April 14th, 1922.

SEC. 3. That all stations owned and operated by the Government, except as herein otherwise provided, shall be used and operated in accordance with the provision of the Act of Congress entitled "An Act to regulate radio communication," approved August 13th, 1912.

Approved, June 5th, 1920.

VENEZUELA

(See Maps 48, 50 and 51.)

THE Republic of Venezuela was formed in 1830 by secession from the other members of the Republic of Colombia. The Constitution in force is that of June 13th, 1914. Legislative authority is vested in a Congress of two Chambers, whilst the Executive power is exercised by a President in conjunction with Cabinet Ministers.

CONTROL AND ORGANISATION.

Radiotelegraphy in Venezuela is controlled by the Government, the Department in charge being the Ministerio of Fomento assisted by the Director of Federal Telegraphs and Telephones..

There are no privately owned Radiotelegraph stations, neither Clubs or Societies.

The Ministerio has granted permission to several Oil Exploration Companies to erect Radiotelephone stations to communicate from the oilfields to the offices, but no such station has yet been erected.

There exist at present eight stations in the different parts of the country, each open for public service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Dr. Antonio Alamo	Minister of Public Works	Caracas.
Gral. Julio Hidalgo	Director-General of Federal Telegraphs and Telephones	Caracas.
Dr. H. R. von Eichwald	Chief of Radio Communication	Caracas.
Lieut. Antonio Toro Key	Director of National Radio School	Caracas.

The plan adopted to erect a radio station in the Capital of each state is still under consideration, as is also the erection of a high power Radio station to work with Europe and the United States of America.

The last named service is actually carried out via Trinidad (VPL) messages being accepted to any part of the world and forwarded via Radio to Trinidad and then by cable. The charges of one bolivar and twenty-five centimos being equally divided between the two stations.

There also exists by Decree, dated July 23rd, 1921, a National School of Radiotelegraphy, an Institution destined to provide the country with native operators for the service. The school is directed by Lieut. Antonia Toro Key, who returned some months ago from the United States of America, where he had been sent by the Government in order to gain instruction and experience in the art of Radiotelegraphy.

ADMINISTRATION.

The laws and regulations relating to wireless telegraphy and telephony are contained under the following :—

A—Radiotelegraphic Regulations.**B—Instructions for Radio Telegraphic Stations.**

DOCTOR V. MARQUEZ BUSTILLOS,

Provisional President of the Republic,

in virtue of Clause 10 of Article 79 of the National Constitution.

DECREES THE FOLLOWING

A RADIOTELEGRAPHIC REGULATION. HEADING NO. I.—PRELIMINARY CONDITIONS.

ART. 1.—Wireless telegraphy or radiotelegraphy in Venezuela will be governed by the Law of Telegraphs and Telephones, by the International Radiotelegraphic Convention, by the other special conventions made in respect thereto, by the conditions of the present Decree, and by others that may be prescribed.

ART. 2.—Pre-eminent control and administration of radiotelegraph installations will be in the hands of the Ministry of Public Works; but if the Federal Executive should desire it, they can in war time be placed under the direction of the War Office and Admiralty.

ART. 3.—The National territory is divided into two zones, subject to regulation and jurisdiction.

The maritime zone comprises the territorial waters of the Republic, including the navigable rivers. The terrestrial zone embraces all the other installations erected within the Venezuelan territory, including islands, shores and banks.

ART. 4.—With the exception of National or foreign warships, no ship which is anchored may use its radiotelegraph installations, while it is not sailing, unless justified by reason of urgency.

ART. 5.—According to their purpose, radiotelegraph stations are divided as follows :—1st, central station; 2nd, local stations; 3rd, training stations; 4th, portable stations.

ART. 6.—Only the National Government may possess radiotelegraph stations in the terrestrial zone of Venezuela. Private people may be able to use them, subject to the ruling conditions and tariffs.

ART. 7.—All National or foreign merchant vessels carrying more than fifty passengers on an ordinary voyage, whether they put in or anchor at Venezuelan ports, must be in possession of a wireless telegraph installation in

perfect condition, and another emergency installation besides, which can work for at least six hours, and be set quickly to work in case of the former apparatus getting out of order in times of danger.

ART. 8.—Boats excepted by the International Conventions and those exclusively devoted to coast navigation through National territorial waters are exempted from carrying wireless installations.

Boats which are exempted from the said obligation may not possess radio installations without previous permission from the Federal Executive.

GENERAL CONDITIONS.

FIRST SECTION.

Signals and Radiotelegraphic Waves.

ART. 9.—The exchange of signals, superfluous words, experimenting or practising that may in any way interrupt radiotelegraphic correspondence is forbidden at ordinary stations.

ART. 10.—The normal length of a wave will be 600 metres. Training and portable stations shall use a smaller one, to be fixed for them, so as not to interfere with ordinary communications.

ART. 11.—Permission is given in exceptional circumstances for other wavelengths to be used in accordance with the limits of the International Regulations.

ART. 12.—The signs used for radiotelegraphic communications will be those of the International Morse alphabet.

ART. 13.—Ships in distress will use the sign adopted by the International Conventions.

ART. 14.—As soon as a station hears danger calls, it shall suspend all correspondence and not resume it until after having made certain that the communication of danger has been concluded; it shall attend to the calls wherever there origin may be, and answer them; it shall in conformity with the notifications from the ship communicate with the authorities of the respective littoral.

ART. 15.—In radio communications between coast and ship stations the call, pauses and inquiries noted in the Regulation annexed to Radiotelegraphic Convention, signed in London on the 5th July, 1912, shall be observed; this will not prevent the use of others for interior service, but in this case the use of those universally adopted signals that might cause confusion is strictly forbidden.

SECOND SECTION.

(1) Personnel of the Radiotelegraph Service.

ART. 16.—The Director-General of Telegraphs and Federal Telephones will be the head of the radiotelegraph stations in everything concerning the service. Anything relating to the inspection and working of the installations, complaints, fulfilment of regulations and application of penalties is included in his duties which he shall exercise direct, giving account of each case to the Ministry of Public Works.

ART. 17.—For the supervision of installations, the Ministry of Public Works may appoint inspectors of radiotelegraphy, with jurisdiction over a particular littoral.

ART. 18.—The radiotelegraphic service of each installation shall be performed by an operator who holds a first-class efficiency certificate. The latter includes:—

- (a) A knowledge of the apparatus and of their arrangement and working;
- (b) A capacity for transmitting and receiving audibly at a minimum speed of twenty words a minute;

- (c) A knowledge of the International Regulations, local laws and regulations compulsorily applicable to the service and exchange of radiotelegraph communications.

ART. 19.—In exceptional cases, when the service has to be entrusted to an operator who has only a second-class certificate, the latter must guarantee the same efficiency as a first class, except in regard to speed transmission and reception capacity, which must never be less than twelve words a minute.

ART. 20.—The duties of bookkeeping and filing at radiotelegraph stations are under the charge of the operator and the Exchequer of Federal Telegraphs and Telephones.

ART. 21.—Radiotelegraph stations, according to their importance and local regulations, shall be worked by a requisite subordinate staff in accordance with the dispositions of the Ministry of Public Works, for dealing effectively with the service.

ART. 22.—Radiotelegraph stations shall be connected with the National Telegraph system.

Radiograms may be handed in at ordinary telegraph offices for transmission by wire to the stations. In these cases the receiving clerk must make separate bookkeeping entries.

(b) School of Radiotelegraphy.

ART. 23.—The School of Radiotelegraphy is an institution for educating the technical staff of the Republican radiotelegraph and radiotelephone stations.

ART. 24.—The Director-General of Telegraphs and Federal Telephones, the Head Professor and a language professor will constitute the personnel of the school.

ART. 25.—The Director-General of Federal Telegraphs and Telephones shall exercise control over the school and see that it is well conducted, notifying the Ministry of Public Works every time amendments are necessary or suitable improvements might be adopted.

ART. 26.—The Head Professor, who is immediately subordinate to the Federal Director-General of Telegraphs and Telephones, shall deal with the organisation and working of the institution, and shall besides give instruction on the subjects necessary for the course of training and in accordance with the programme of studies which he shall elaborate and submit for approval to the Ministry of Public Works.

ART. 27.—The Language Professor shall give pupils the special instruction desired and do his best besides to assist in the good management of the school.

ART. 28.—To be admitted as a pupil in the school the following is necessary:—

- (a) To be over eighteen and under thirty-five years of age;
- (b) A holder of a high grade certificate of instruction;
- (c) To be known to be of good conduct;
- (d) A holder of a certificate from the National Health Office certifying good health;
- (e) Written permission from a legal representative in the case of minors.
- (f) To request registration in a legal form within the prescribed time before the opening of a term. The request shall be addressed to the Minister of Public Works and shall be accompanied by the confirmation that the other requisites herein mentioned are complete.

ART. 29.—The number of pupils that will form a radiotelegraphic course shall in every case be fixed by the Ministry of Public Works.

ART. 30.—Nobody can be appointed to take an operator's position in the Republican Radiotelegraph or Radiotelephone Service who has not obtained a diploma for efficiency.

ART. 31.—In order to obtain the diploma referred to in the previous Article it is necessary to have gone through a course at the School of Radiotelegraphy in the subjects contained in the schedule of studies and to have passed the requisite examination satisfactorily, which shall consist of three divisions:—

(i) A half an hour's oral test on subjects taken by ballot from the programme which shall be done by numbering slips from one upwards to the number of subjects contained in the programme.

(ii) To draw up in fifteen minutes a document of the service proposed by the Examining Board.

(iii) Transmitting and receiving practice for fifteen minutes. In no case will a candidate be approved who has not executed a speed minimum of twelve words a minute.

ART. 32.—The optional examinations for the diploma are always individual ones, and can be arranged at any time on the date fixed by the Ministry of Public Works, in accordance with the request which the candidate must make in legal form, which must bear at the foot thereof the certificate issued by the Director of the School, stating that the candidate has attended the course regularly, been punctual for the classes and done the tasks required in accordance with the schedule of studies.

ART. 33.—If the candidate should be approved, besides the diploma a certificate will be sent him, a first-class one if the transmitting and receiving speed is a minimum of twenty words a minute, and a second-class one if the speed varies between twelve and nineteen words a minute.

ART. 34.—The examining boards for the diploma shall consist of five members: the Director-General of Federal Telegraphs and Telephones, the Head Professor of the School of Radiotelegraphy and three technical specialists, preferably chosen from first-class operators.

THIRD SECTION.

RADIOTELEGRAPHIC SERVICE, OFFICIAL AND PRIVATE.

I.—Order and Preference.

ART. 35.—The radiotelegraph service is intended chiefly for commerce and private people. Only when it is a question of messages sent by the President of the Republic or by the Commander-in-Chief of the National Army, in case of interruption of the ordinary lines or on matters of distinct urgency may the wireless telegraph of the terrestrial zone be used for official communications.

ART. 36.—Radiograms shall be despatched in the following order:—

- (a) Official service, and this will be according to the rank of the sending official.
- (b) Private radiograms in the order in which they are handed in.

ART. 37.—Radiograms referred to in Article 13 shall have absolute priority.

II.—Free Traffic.

ART. 38.—Radiograms will be free that are sent on service matters by officials authorised by the Law on Telegraphs and Telephones of the 20th June, 1918.

ART. 39.—Free traffic is not exempt from the supplementary taxes of ships and other foreign stations that have to handle the communications,

ART. 40.—The right to send a reply free of charge is proved by the presentation of the official radiotelegram or telegram requiring it.

III.—Tariff.

ART. 41.—The radiotelegraphic charge will be:—

I.—For Interior Service.

- (a) Radiotelegraphic charge, properly so-called at the rate of B. 0.25 a word with a minimum of ten words for every radiogram.
- (b) Telegraphic or postal charge, or both, according to the means of communication to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

II.—For Exterior Service.

- (a) Radiotelegraphic charge properly so-called at the rate of B. 0.60 per word, with a minimum of ten words for every radiogram.
- (b) Coast or ship tax of the station or ship to which the radiogram is sent according to the special tariff for same.
- (c) Telegraphic or postal charge, or both, according to the means of communication that may have to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

Sole paragraph. In the radiotelegraphic charge properly so-called the address and signature will be collected both for interior and exterior service.

IV.—Secrecy.

ART. 42.—All legal dispositions relating to keeping correspondence secret shall be applied to radiotelegrams.

ART. 43.—Only the President of the Republic, the Commander-in-Chief of the National Army, the Ministers of the Interior, the Governor of the Federal District and National Diplomatic Ministers or foreign residential ones may send or receive messages in code without any restriction.

ART. 44.—Subordinate employees will also be allowed to send cypher radiograms when dealing with a reply so required by their superiors mentioned in the foregoing Article.

ART. 45.—In International communications private people may for the purposes of economy use ordinary well-known telegraphic codes; but in every case the translation of the message must be attached so that it can be filed with the original radiogram.

HEADING NO. III.

SPECIAL CONDITIONS.

FIRST SECTION.—PENALTIES.

ART. 46.—Breaches of the present Regulations will be punished by fines from 100 to 20,000 bolivares, which will be applied by the Director of Federal Telegraphs and Telephones, or imprisonment in proportion. In the event of their being guaranteed these fines will be subject to appeal before the Ministry of Public Works.

ART. 47.—The possession or use of clandestine radio electrical installations will be punishable by fine up to 20,000 bolivares and also by Government confiscation of apparatus and instruments; without prejudice to a prosecution that might be taken up, when besides infringing these conditions the fact constitutes an offence against the security of the State or the Constitutional Powers.

SECOND SECTION.—INSTRUCTIONS.

ART. 48. — By separate resolutions the Ministry of Public Works will draw up the instructions to be observed in the radiotelegraph service; it will fix the places where the stations shall be installed; it will grant the permits referred to in Article 8; it will organise the instruction and examination of operators; it will fix bases for bookkeeping, and will prescribe all rules of a technical character that have to be observed in the service.

Given, signed, sealed with the seal of the Federal Executive and countersigned by the Minister of Public Works, at the Federal Palace, Caracas, on the thirty-first day of the month of January, 1921. The 111th year of Independence and the 62nd of the Federation.

(Place for the Seal.)

V. MARQUEZ BUSTILLOS.

Countersigned.
Seal.

G. TORRES,
The Minister of Public Works.

INSTRUCTIONS FOR RADIOTELEGRAPHIC STATIONS.

B *United States of Venezuela—Ministry of Public Works—Direction General of Statistics and Communications.*
CARACAS, 31st January, 1921.
111th and 62nd Year.

It is Resolved:

By Order of the Provisional President of the Republic and in conformity with Article 48 of the Radiotelegraphic Regulations for the following to be binding.

PRELIMINARY REMARKS.

The present instructions contain the rules which must be observed by the Venezuelan stations in the execution of the Radiotelegraphic Service.

These rules refer principally;

- (1) To the tariff.
- (2) To the transmission of radiotelegrams.
- (3) To the admission and classification of messages.
- (4) To the signals adopted.

Besides the present instructions, the object of which is to facilitate the regularity of the service, the Venezuelan radiotelegraphic stations will be subject to the Law of Telegraphs and Telephones, to the International Telegraphic Convention and the International Radio-Telegraphic Convention, as well as the regulations annexed to these. The said date will furnish the basis for the execution of the service in the International régime.

The stations will be also subject to the telegraphic tariff used in Venezuela and to those besides which link up the service with the exterior so as to make up the total rate of each message. Likewise they will be subject to the nomenclature of the radiotelegraphic stations, and finally to all the legal conditions and Venezuelan regulations referring to the radiotelegraphic service.

NO. 1.—RADIOTELEGRAPHIC STATIONS.

A. Radiotelegraphic stations are shown in the "nomenclature of radiotelegraphic stations." This nomenclature gives the following particulars in regard to every station:—

- (1) For coast stations, the name, nationality, and geographical position indicated by the territorial division, and by the longitude and latitude of the place; for ship stations, the name, and nationality of the ship, and in certain cases the name and address of the owner.

(2) The call signal. (The signals are different from one another, and each one is formed by a group of three letters.)

(3) Normal range.

(4) The radiotelegraphic system of transmission (musical spark, tonality expressed by the number of duplicate vibrations, etc.)

(5) Length of waves used. (The length of the normal wave is underlined.)

(6) The nature of the services effected.

(7) The hours of opening.

(8) If the case should arise the hour and method of sending hourly signals and meteorological reports.

(9) The coast and ship tariff.

B. The name of the ship station as shown in the first column of the nomenclature is followed in case of ambiguity by the call signal of the station.

C. The following abbreviations are used in service documents:—

P.G.—Station opened for public correspondence in general.

P.R.—Station opened for restricted public correspondence.

P.—Station opened for private interests.

O.—Station opened only for official correspondence.

N.—Station for permanent service.

X.—Station with no fixed intermission.

D. At coast stations the service will be as far as possible permanent by day and night without interruption. Nevertheless, some stations can carry on a service of limited duration.

Coast stations where the service is not permanent may not suspend their work until having transmitted all their radiotelegrams to the ships which are in the sphere of action, nor until after having received from these ships all the radio telegrams advised. This condition is likewise applicable when ships signal their presence before the suspension of work has been effected.

E. Ship stations are divided into three categories:—

(1) Stations for permanent service.

(2) Stations for limited service.

(3) Stations with no fixed intermission.

During navigation the following must remain in expectation of reception:—

(1) Stations under the first category.

(2) Those under the second category during service hours, and outside of those hours during the first ten minutes of each hour.

Stations of the third category are not bound by any regular waiting service.

The radiotelegraphic service of the ship station is under the supreme authority of the commander or captain of the ship.

F. Fixed stations of the terrestrial zone are divided according to their purpose into four categories, namely:—

(1) Central station.

(2) Local stations.

(3) Training stations.

(4) Portable stations.

G. The central station as regard service is bound by obligations of the coast stations.

Local internal stations, which, on account of their position, are outside of communication with ships, will be worked like ordinary national telegraph offices.

Training and portable stations will be governed by the special provisions concerning them which will be prescribed in each case by separate resolutions.

H. All fixed radiotelegraphic stations will be linked with the telegraphic system of Venezuela. By the latter, radiotelegrams can be sent and received.

NO. 2.—RADIOTELEGRAPHIC CORRESPONDENCE.

A. Every person has the right to make use of International radiotelegraphic communication.

The sender of a private telegram is obliged to prove his identity when asked by the office or station of origin.

The right to correspond radiotelegraphically is subject, nevertheless, to the fulfilment of the local regulations and tariffs.

B. The Government does not accept any responsibility by reason of the radiotelegraphic service supplied to private people.

C. The text of the telegram must be written legibly in characters which have their equivalent on the telegraphic signals used in Venezuela. These characters are as follows:—

LETTERS.

A B C D E F G H I J K L M N O P Q R S
T U V W X Y Z.

ã ñ ö ü.

FIGURES.

1 2 3 4 5 6 7 8 9 0.

SIGNS OF PUNCTUATION.

Full stop (.) ; comma (,) ; semi-colon (;) ; colon (:) ; note of interrogation (?) ; exclamation mark (!) ; apostrophe (') ; hyphen (-) ; parenthesis () ; inverted commas (" "); oblique (/) ; underline (_).

D. The various parts of which a telegram is composed should be written in the following order:—

- (1) Supplementary instructions.
- (2) The address.
- (3) The text.
- (4) The signature.

E. The sender must write on the form immediately before the address the supplementary instructions.

Multiple radiotelegrams will have this remark written immediately before the addresses concerned.

The remark "Urgent" is not admitted in Venezuela except on the ordinary telegraphic system.

F. Every address must contain at least two words. The first giving the name of the addressee, the second indicating the station of destination. Nevertheless, if the address is lacking in further necessary particulars for the addressee to be traced without difficulty by the office of destination the sender shall abide by the consequences of insufficient address.

G. The address of radiotelegrams destined for ships must be as full as possible. They must necessarily contain:—

- (a) Name or capacity of the addressee with supplementary particulars if need be.
- (b) Name of the boat as shown in the first column of the nomenclature.
- (c) Name of the coast stations as shown in the nomenclature.

Nevertheless, the name of the ship may be substituted at the sender's risk by the route indication and determined by the name of the

ports of origin and destination or by some other similar remark.

H. Telegrams without text are admitted.

The text may be written in plain language or in secret language, and in the latter case it may be in code language or in cypher language. Each one of these languages may be used singly or in combination with others in the same telegram.

It can also be written by means of the International Code of signals. The radiotelegraphic station will not translate this text when the telegram has to be retransmitted to another station.

I. The station of origin in Venezuela does not admit messages in secret language except on condition that they fulfil the requirements established in Article 45 of the radiotelegraphic Regulations. This provision is not applicable to transit telegrams.

J. Plain language is understood to be that which suggests an intelligible meaning in one or more of the languages authorised for international telegraphic correspondence.

The use of code addresses, commercial signs, international code signals, abbreviations, initials such as f.o.b., c.i.f., or analogous terms do not deprive the telegram of its plain language character.

K. Code language is composed of words that do not form intelligible sentences.

Words actual or artificial must be pronounceable in Spanish, German, French, Dutch, English, Italian, Portuguese or Latin.

Artificial words must not bear accented letters.

Code language must not have more than ten characters of the Morse alphabet. The ch or any other combination of vowels or double consonants will be counted as two letters in artificial words.

Words formed by the combination of two or more in plain language against the usage of the language are not admitted.

L. Cypher language is that formed by—

(1) Either Arabic cyphers, groups or series of Arabic numbers with a secret meaning, or by letters (unaccented), groups or series of letters with a secret meaning

(2) Words, names, expressions or combinations of letters which do not fulfil the conditions of plain language nor of code language.

The mixture of cyphers and letters with a secret meaning is not admitted in the same group.

The groups referred to under paragraph J are not considered to be of secret meaning.

M. The signature is not obligatory; it may be written by the sender in accordance with custom or substituted by a registered address.

It is indispensable for every message to be signed in Venezuela, although the signature need not be transmitted, at any rate the registered address used as the signature must be translated at the foot of the telegram.

NO. 3.—OFFICIAL RADIOTELEGRAMS.

A. An official message is understood to be that dealing with matters of public service and sent by a Government official in the exercise of his duties.

B. Official radiotelegrams must bear the seal of or a memorandum from the sending official unless there is no doubt of their authenticity.

C. The right to send a reply as an official radiotelegram is proved by the production of the message requiring it.

D. Official radiotelegrams can in any case be written in secret language.

E. The receiving station must repeat official messages; partially if they are written in plain language, and wholly if in secret language.

NO. 4.—SERVICE RADIOTELEGRAMS.

A. Only authorised employees can send service radiotelegrams free. This privilege is limited to radios that present an urgent character and they must be written in a concise form. Exclusive of such cases the station may refuse the message or forward a duplicate by post.

B. Service advices may also be exchanged free of tariff between two or more stations respecting repetitions, rectifications, or cancellation of messages or anything affecting the correct transmission.

C. When the service advice is requested by a private person it will be charged according to the tariff. In communications with boats the advice may only refer to the rectification of radios previously transmitted. The letters S.T. must precede the preamble of these radiotelegrams. If there should be need to rectify a word it will be indicated by the position it occupies in the text of the message, independent of the rules of taxation.

NO. 5.—METHOD OF COUNTING WORDS.

A. All that which the sender writes on the form for transmission is subject to taxation, and is included in the number of words. Hyphens which separate words and signs of punctuation are only transmitted by special request or when they form groups of signs in secret language, and in these cases they are subject to tariff.

B. The name of the station, number of the radiotelegram, time of handing in and other indications in the preamble are not counted or charged unless the sender inserts any of these remarks in the text of his radiotelegram, and then they form part of the number of chargeable words.

C. One word is counted for the following, in all languages:—

(1) In the address.

(a) The name of the office of destination (or the coast station) written as shown in the first column of the nomenclature with the relative indications.

(b) The names of the territorial subdivisions respectively written in accordance with the nomenclature.

(2) The name of the ship as shown in the first column of the nomenclature.

(3) The code words fulfilling the conditions under paragraph K of No. 2.

(4) Every isolated character, letter or cypher, as well as every sign of punctuation apostrophe or hyphen transmitted at the sender's request.

(5) The underline.

(6) The parenthesis signs.

(7) The inverted commas.

(8) The supplementary instructions.

D. In plain language any word or authorised group containing fifteen letters of the Morse alphabet is reckoned as a single word. Any

characters in excess, should there be any, are calculated as an additional word.

In code language every ten characters are counted as one word.

In cypher language every five letters or numbers are counted as one word.

E. If in the same message there should be complete sentences in plain language and in code language or cypher language the words in each sentence will be counted according to the former rule; but if there should be code or cypher words intercepted in the plain language the whole radiotelegram will be considered as cypher, and if without cyphers as code language.

F. Words joined by hyphens and apostrophes will be counted as separated and the syllabic sounds by the number of letters of which they are composed.

G. The combination of words against general usage is not admitted. Usage is justified if the point should arise by reference to a dictionary of the respective language.

H. The counting of words at the station of origin is decisive, but if the office of destination should discover an error it may claim the excess from the addressee, and if the latter should refuse to pay it have a service advice sent for the amount to be collected from the sender. When the latter has paid the difference another service advice will be sent authorising delivery of the message.

NO. 6.—TARIFFS AND TAXATION.

A. Radiotelegrams originating from a ship are taxed as addressed to the nearest coast station. In the charge the supplementary telegraphic tariff will be included.

B. When the sender gives instructions on his message for the retransmission of the radiotelegram to another station he shall pay the tariff relative to each service. This rule will be applied when the retransmission of a radio sent by land is effected through two or more ship stations.

C. The total rate for telegrams will be collected from the sender except:—

(1) Express charges.

(2) Portage charges by the station of destination.

(3) In cases provided for under letter G of this paragraph.

D. The rate will be collected in bolivares, and foreign tariffs will in each case be converted to this currency.

E. Rates will be fixed in accordance with the particulars in the nomenclature.

F. Ship stations may obtain information from coast stations when they are not in possession of all the necessary particulars for making up the rate of the telegrams.

G. When the transit tax is not shown in the nomenclature the office of origin will include in the preamble the remark "tax to be collected." The same thing will be done when it is from a sender in a country not adherent to the International Conventions.

H. The sender of the radiotelegram has the right to ask for a receipt with a note of the amount collected. The office of origin may charge a fee for this of 25 cents.

NO. 7.—TRANSMISSION OF RADIOTELEGRAMS.

A. The length of a normal wave is 600 metres. Every station must be equipped so as to be able to send waves of 300 metres as well. But it must always be in condition to receive calls made by means of the normal wavelength.

B. Stations intended exclusively for determining the position of ships must not use wavelengths exceeding 150 metres.

C. The foregoing conditions, indispensable to a good public service shall not prevent, if the case should arise, for the Government to make any variations which it may judge convenient for its radiotelegraphic correspondence.

D. Stations must maintain traffic with the least waste of power. Ship stations must not use more than 1 kW. unless the boat is obliged to communicate at a distance exceeding 200 nautical miles, or when exceptional circumstances require an increase in power.

E. The exchange of signals, superfluous words, experimenting or practice, that may disturb the service of other stations is forbidden. For this reason training and portable stations will use wavelengths different to the normal.

F. Should the foregoing rules be infringed the station must lodge a complaint in detail to the Director-General of Federal Telegraphs and Telephones.

NO. 8.—TRANSMITTING SIGNALS.

A. The Morse Code signals are used in the service.

B. The spacing and length of the signals is as follows:—

- (1) The dash is equal to three dots.
- (2) The space between the signals of the same letter is equal to a dot.
- (3) A space between the two letters is equal to three dots.
- (4) A space between two words is equal to five dots.

C. Letters are represented by the signal shown in the following table:—

a	• —	n	— •
ä	• • —	ñ	— • • —
á	• — • —	o	— — —
b	— • • •	ö	— • • •
c	• • • •	p	• — — •
ch	— — — —	q	— • • •
d	— • •	r	• • •
e	•	s	• • •
é	• • • • •	t	—
f	• • • •	u	• • —
g	— — •	ü	• • • —
h	• • • •	v	• • • •
i	• •	w	• — —
j	• — — —	x	• • • —
k	• • •	y	• — — —
l	• • • •	z	— • • •
m	— —		

D. The figures are represented as follows:—

1	• — — — —	6	— • • • •
2	• • — — —	7	— • • • •
3	• • • — —	8	— • • • •
4	• • • • —	9	— — — — •
5	• • • • •	0	— — — — —

In office repetitions and in the preamble and in cypher telegrams with the remark "in cypher" numbers may be abbreviated as follows:—

1	• —	6	— • • • •
2	• • —	7	— • • • •
3	• • • —	8	— • • • •
4	• • • • —	9	— •
5	• • • • •	0	—

E. Signs of punctuation and other indications are represented as follows:—

Punto (.)	• • • • •
Coma (,)	• — • — • —
Punto y coma (;)	— • — • — • —
Dos puntos (:)	— — — • •
Punto de interrogación o demanda de una transmisión no comprendida (?)	• • — — • •
Punto de admiración (!)	— — — • • — —
Apóstrofe (')	• — — — —
Guión (-)	— • • • — —
Raya de fracción (/)	— • • • •
Paréntesis, antes y después de las palabras ()	— • — — • —
Comillas, antes y después de las palabras (" ")	• — • • • •
Subrayado antes y después de las palabras o de las frases	• • — — • •
Llamada (preliminar de toda transmisión)	— • — • —
Doble guión (=)	— • • • —
Comprendido	• • • • •
Error	• • • • •
Cruz (+)	• — • • •
Invitación a transmitir	— • — —
Espera	• • • • •
Fin de trabajo	• • • • —
Señal de siniestro (repetida a cortos intervalos)	• • • — — — • •

In the transmission of fractions, whole numbers should be separated from the fractions by the double hyphen (=) so as to avoid—e.g., 11/4 being confused with 1=1/4.

F. When a station notices the distress signal • • • — — — • • it shall suspend all correspondence, and not renew it until having made certain that the communication which originated by the call for help has been concluded.

G. The station which perceived a call for help must obtain all necessary particulars from the ship making the call as regards the order of the communication or the cessation of them.

H. When a signal for help is addressed to a particular station it devolves upon the latter to reply unless it cannot reply. In the absence of a special indication each station is obliged to answer.

I. Stations must alternate in their transmission of radiotelegrams and each series should not exceed fifteen minutes.

J. A transmission begun shall only be suspended in case of absolute urgency.

K. Radiotelegrams of the same category shall be forwarded in the order in which they are handed in.

L. The order of priority is as follows:—

- (1) Official radiotelegrams in accordance with the rank of the sending official.
- (2) Service radiotelegrams.
- (3) Private radiotelegrams.

M. The call signal is composed of the sign — • • — followed by the call repeated three times by the station called, the word "from" and the signal repeated three times from the station calling.

N. The station called replies by the signal — • • — followed by the call signal repeated three times from the station in question by the word "from" its call signal, and the sign — • • —

O. As a general rule the ship station is the one that calls the coast station whether the latter should have radiotelegrams to transmit or not.

P. Stations which want to communicate with ships without knowing the names of those in their sphere of action may use the exploration signal — • — • — • — • — • —

Q. Every station that is obliged to effect transmission of high power first of all sends the advice signal three times — • — • — • — • — • — with the minimum power required for reaching the neighbouring stations. The high power shall not be begun to be transmitted until thirty seconds after the despatch of the advice signal.

R. If a station cannot reply to a call signal which is repeated three times at intervals of two minutes each, the call cannot be repeated until an interval of fifteen minutes has elapsed. The station calling verifying that there is no other radiotelegraphic communication in progress.

S. The ship station must inform each coast station to whom it has signalled its presence when it proposes to cease operations, and how long the interruption will last.

T. As soon as the coast station has replied the ship station will furnish the information that follows, if it has messages to be transmitted to it, the following information will also be given when the coast station asks for it:—

(a) The approximate distance in nautical miles from the ship to the coast station.

(b) The position of the ship shown in a concise manner, clear and applicable to the circumstances of the case.

(c) The nearest port at which the ship will touch.

(d) The number of radiotelegrams, if they are of ordinary length, or the number of words if they are exceptionally long.

The speed of the ship in nautical miles will be specially shown at the particular request of the coast station. The coast station should reply at once and indicate the number of radiotelegrams that it has to transmit.

In case the transmission cannot be made immediately, both should communicate the approximate duration of the time of waiting.

Between two ship stations it devolves upon the station called to fix the order of transmission.

When a coast stations receives calls from various ship stations it shall decide the order for reception endeavouring for this purpose to procure from every station taking part the transmission of the greatest number of radiotelegrams.

A telegram which is not in order must not be delayed or refused. It must be received and a request made if necessary by service advice for correction.

U. Before beginning a transmission a ship station shall advise whether it should be done in series or in alternate order; the transmission will then be begun by means of the signal — • — • — • — • — • —

V. The transmission of the radiotelegram is preceded by the signal — • — • — • — • — • — The station proceeds at once with the transmission of the preamble in the following order:—

(a) Service remark "radio."

(b) Nature of the radiotelegram by one of the remarks S, A, D, according to whether it is an official message, service advice or a private urgent message.

(c) The letter B is only used when the station is in direct communication with the station of destination.

(d) Office of origin or ship station.

(e) Number of the telegram.

(f) Number of changeable words.

(g) The time of handing in by two groups of figures; the first showing the day of the month, and the second the hour and minutes.

Ship stations shall show the time by the number 0-24.

(h) The route to be followed will be shown on the form.

(i) Service remarks.

W. After the preamble the supplementary instructions, the address, the text and the signature will be consecutively transmitted.

The double hyphen (— • — • — • — • — • —) is transmitted so as to separate the preamble from the supplementary instructions and the other parts of the telegram.

The transmission concludes with a signal — • — • — • — • — • — followed by the signal of the sending station and by the signal — • — • — • — • — • —. In the case of a series the signal and the sign — • — • — • — • — • — will not be given until the end of the series.

When a radiotelegram contains more than forty words the sending station may interrupt the transmission after every twenty words more or less by means of a sign of interrogation • • — • — • • — • — and will not go on with the transmission until the repetition of the last word has been properly received, followed by a note of interrogation or if the transmission is correct by the signal — • — • — • — • — • —. If the operator, who is making the transmission, finds that he has made a mistake he will interrupt it by the error signal • • • • • • • • • •, the last word which was correctly transmitted being repeated and the rectified transmission continued.

In the case of transmission by series the advice of receipt will be given after every radiogram.

The coast stations occupied in transmitting long radiotelegrams must suspend transmission at the end of a period of fifteen minutes, and keep silent for three minutes before continuing the transmission.

X. The advice of receipt will be given by means of the letter R followed by the number of the radiotelegram received. This advice is preceded by the indication signal of the sending station and followed by that of the receiving station.

Y. The conclusion of the operation between two stations is indicated by each one by means of a signal • • — • — • — • — • — followed by the relative indication.

Z. When signals are doubtful the radiotelegram may be repeated up to three times. If it is still illegible it is cancelled.

In any case the receiving station can send it to its destination bearing the service mark "reception doubtful".

The sender of a radiotelegram who establishes his identity may cancel it. If it should not have been transmitted the charges will be returned to him with the exception of a tax of 25 cents. bolivares.

If the transmission should have already been effected the cancellation will be made by a taxed service advice.

No. 9.—FORWARDING TO DESTINATION.

A. The sender may order a radió to be sent by telephone. If so, the word "Telephone" shall be written before the address.

B. For despatch to destination radiograms are classified in the same order of priority as for transmission.

C. Radios with the remark "Day" are not delivered during the night; those received during the night are not immediately delivered unless they contain the word "Night," or the receiving station should consider them to be of a real urgent character.

D. The radiogram may be delivered in the absence of the addressee to the members of his family, and to persons in his employ. The remark "M.P." or "manos propias," i.e. (own hands), as well as the remark "Open," are only admitted in official correspondence.

E. When the radiograms cannot be delivered the station of destination shall explain the reason by service advice. If need be, a mistake in the address will be corrected.

F. Radiograms not transmitted shall be sent by post to the Director-General of Federal Telegraphs and Telephones to be filed.

G. When a radiogram has to be transmitted to a boat and the latter is not yet within range of the station, it will be treated like a message not transmitted, the sender being advised on the eighth day unless the latter should order another waiting period of nine days. If the station is sure that the ship has sailed from its range it may cancel the message and advise the sender.

Let it be communicated and published.

By the Federal Executive,

G. TORRES.

WEIHAIWEI

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. A. P. Blunt, C.M.G.	Officer Administering the Government.	Government House, Port Edward Weihaiwei.
Mr. H. Jowett	Senior District Officer	Government Offices, Weihaiwei.

ADMINISTRATION.

Wireless Telegraphy in the territory is governed by:

A—Ordinance No. 5 of 1913.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

A

L.S. August 11th, 1913.
BE IT ENACTED by the Commissioner of Weihaiwei as follows:—

1. The Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" (as defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Commissioner may whenever he shall deem it expedient to do so licence the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory.

4. (i) No person shall establish any wireless telegraph station or install or work any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory except under and in accordance with a licence granted in that behalf by the Commissioner.

(ii) Every such licence shall be in such form and for such period as the Commissioner may determine and shall contain

such terms, conditions and restrictions on and subject to which the licence is granted as the Commissioner shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Commissioner.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a licence in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a licence in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Commissioner may make regulations for all or any of the following matters:—

(i) For prescribing the form and manner in which applications for licences under this Ordinance are to be made;

(ii) For prescribing the fees payable on the grant of any licence;

(iii) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the

territory shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the territory or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) For prohibiting except with the special or general permission of the Commissioner the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the territory;

(v) For prohibiting or regulating in case at any time in the opinion of the Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board British ships whether British or foreign in the waters of the territory the use of wireless telegraphy on board such ships while in such waters by such further rules as the Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii), (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a licence proves to the satisfaction of the Commissioner that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy a licence for that purpose shall be granted subject to such special terms, conditions and restrictions as the Commissioner may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any licence has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. Ordinance No. 1 of 1904 to regulate the establishment of wireless electric telegraphy is hereby repealed.

ZANZIBAR

(See Maps 25, 28 and 33.)

Including : Pemba.

THE Zanzibar Protectorate includes the islands of Zanzibar and Pemba. The Legislative Council comprises the Sultan, the British Resident and seven members.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	Title.	Address.
Mr. R. Withycombe, M.B.E.	Director of Electricity, Railways, and Wireless Telegraphy	Zanzibar
Mr. S. W. Dyer	Assistant do. do. do. do.	Zanziba

ORGANISATION.

The Government maintains wireless stations in Zanzibar, and Pemba.

ADMINISTRATION.

We append herewith the Decree issued by the Sultan in 1909 in regard to wireless.

WIRELESS TELEGRAPHY DECREE.

No. 6 of 1909.

In the name of the Most Merciful God.

It is hereby declared as follows:—

1. (1) No person shall establish any wireless telegraph station or install any apparatus for wireless telegraphy in any place in our dominions except under and in accordance with a licence granted in that behalf by our First Minister.

(2) Every such licence shall be in such form and for such period as our First Minister may determine, and shall contain the terms,

conditions and restrictions on and subject to which licence is granted, any such licence may include two or more stations or places,

(3) If any person establishes a wireless telegraph station without a licence in that behalf or installs or works any apparatus for wireless telegraphy without a licence in that behalf, he shall be guilty of an offence against this Decree, and on conviction he shall be liable to a fine not exceeding 1,500 rupees, or to simple imprisonment for a term not exceeding twelve months, or to both, and in either

case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a licence, but no proceedings shall be taken against any person under this Decree except by the order of our First Minister.

(4) If the Court is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within its jurisdiction without a licence in that behalf, it may grant a warrant to any officer of our police to enter and inspect the station or place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Our First Minister may make regulations for prescribing the form and manner in which applications for licences under this Decree are to be made and fees payable on the grant of any such licence.

2. Where the applicant for a licence proves to the satisfaction of our First Minister that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a licence for that purpose shall be granted, subject to such special terms, conditions, and restrictions as our First Minister may think proper, but shall not be subject to any rent or royalty.

3. No person shall work any apparatus for wireless telegraphy installed on any ship whilst that ship is in the waters of our dominions

otherwise than in accordance with regulations made in that behalf by our First Minister, and our First Minister may by any such regulations impose penalties for the breach of any such regulations not exceeding 150 rupees for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Decree shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. The term "ship" includes steamers, sailing ships, dhows, lighters, rafts, and every other form of boat. The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Indian Telegraph Act, 1883" without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Decree shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

5. This Decree may be cited as "The Wireless Telegraphy Decree, 1909."

Given under our hand and seal this 9th day of February, 1909.

ALI-BIN-HAMOUD.

Countersigned under the provisions of Article 47 of "The Zanzibar Order in Council, 1906."

JOHN H. SINCLAIR,
British Agent and Consul-General

FRANCE AND ALGERIA.

SUPPLEMENTARY REGULATIONS RELATING TO WIRELESS TELEGRAPHY ON SHIPS.

The following translation from the *Journal Officiel de la Republique Francaise*, of November 23rd, 1923, was received after the Laws and Regulations for France and Algeria (pages 234 to 248) had been printed.

DECREE DATED NOVEMBER 10TH, 1923,
REGULATING WIRELESS TELEGRAPHY ON SHIPS.
THE PRESIDENT OF THE FRENCH REPUBLIC,

Having regard to the law of the 29th November, 1850, respecting private telegraphic correspondence;

Having regard to the decree-law of the 27th December, 1851, concerning the monopoly and polity of telegraph lines;

Having regard to the decree of the 5th March, 1907, relative to the establishment and working of wireless telegraph stations destined for the exchange of official or private correspondence;

Having regard to the decrees of the 17th June, 1912, establishing the wireless telegraph service;

Having regard to the law of the 17th January, 1914, approving of the International Radiotelegraph Convention and its Annexes, drawn up by the London Conference of the 5th July, 1912;

Having regard to the decree of the 6th April, 1923, regulating radiotelegraphy on board commercial or fishing boats from the point of view of maritime safety;

On the report of the Minister of Public Works,
DECREES—

ART. I.—No installation for radio communication intended for commercial working may be erected on board French commercial, fishing or pleasure boats without authority from the Government.

The authorities fix the characteristics and working conditions of the station. The working is carried out under the control of the Postal, Telegraph and Telephone Administration.

The installations referred to in the first paragraph of this Article may not be opened for working without the licence prescribed by the international radiotelegraph regulations.

ART. 2.—From the point of view of the service of public radiotelegraphic correspondence, radiotelegraph stations established on board vessels are divided, at the request of the shipowners, into the three following categories:—

First Category.—Ships stations having to undertake continuous service.

These stations are worked by three operators holding the certificate prescribed by the international radiotelegraph regulations. Two of these operators must hold first-class certificates.

Nevertheless, on the authority of the Administration of the Posts and Telegraphs, the ship stations classified under the first category may—when the vessel in question is allocated to special services or specific navigations of short duration—only be worked by two operators or by one operator.

In the two latter cases the operator or operators must possess a first-class certificate.

Second Category.—Ship stations having to undertake a service of limited duration.

The stations coming under the second category must have one or two operators on board possessing the certificate prescribed by the international radiotelegraph regulations, according to whether the station in question guarantees a service of eight hours or sixteen hours.

One at least of the operators must be the holder of a *first-class* certificate.

The hours during which the stations coming under this category are to guarantee watch service are those shown in the annex to the present decree.

Third Category.—Stations on ships not having any specific hours of watch. Stations coming under the third category must have an operator on board possessed of a first or a second-class certificate.

ART. 3.—The Postal, Telegraph and Telephone Administration is entrusted with the furnishing of working licences for ship stations.

The application for a licence must be made by the owner of the vessel in question who shall specify the category under which he desires the ship station to be classified from the point of view of his obligations as regards watch service for *public correspondence*.

ART. 4.—The Postal, Telegraph and Telephone Administration undertakes the supervision of the staff and the technical material of ship stations; this supervision shall likewise be exercised on board foreign vessels putting in at French ports.

ART. 5.—Consequent upon the supervision exercised, the Postal, Telegraph and Telephone Administration may, as regards the service of radiotelegraphic correspondence, take any disciplinary measures that it may deem advisable in respect of the staff and require any modifications in the installation it may consider necessary.

The disciplinary measures relative to the staff shall consist in a warning, a suspension of one to six months, or a definite withdrawal of the certificate. The sanctions relative to the non-execution of the modifications in question shall consist in the application of the measure provided for in paragraph 2 of Article 12 of the 1912 London Radiotelegraph Regulations (prohibition to coast stations to accept communications from the vessel in fault with the exception of distress signals).

ART. 6.—The Postal, Telegraph and Telephone Administration is entrusted with the furnishing

of certificates of proficiency to radiotelegraphists, as provided for in Article 10 of the International Radiotelegraph Regulations of London, 1912, and the certificate of an authorised listener as provided for in Article 6 of the decree of the 6th April, 1923.

A second-class certificate consists of two kinds (A and B), the second of which is reserved for operators of fishing boats and commercial boats of the third category as entered in the official nomenclature of radiotelegraph stations bearing the note "P" (private station).

A decree of the Under-Secretary of State of Posts and Telegraphs determines the conditions on which certificates of proficiency will be issued.

ART. 7.—Telegraphists must comply with the service regulations in force; in no case and for no reason may a ship station use a call signal other than that which has been allotted to it without the authority of the Postal, Telegraph and Telephone Administration.

Radioelectric communications are forbidden whilst vessels are lying in port or are at anchor, except in the latter case with regard to questions concerning navigation or the working of the ship, when the latter is not able to communicate with the land.

Nevertheless, transmission may be made respecting adjustments of the apparatus at ports and during anchoring after previous authority from the Chief of the State coast station, if there be one within a radius of 30 kilometres from the vessel, but without previous authority if there should not be one.

All service incidents of whatever nature they may be, must be recorded with all requisite particulars in the ship station's diary.

ART. 8.—The service of the ship station is placed under the supreme authority of the captain of the vessel, who shall be obliged to preserve the secrecy of correspondence.

ART. 9.—The Minister of Public Works is entrusted with the execution of the present decree, which shall be published in the *Journal Officiel*, and inserted in the Bulletin of Laws.

Given at Paris, 10th November, 1923.

A. MILLERAND.

For the President of the Republic:
The Minister of Public Works,
YVES LE TROQUER.

UP to the time of going to press we have been unable to obtain any information regarding special laws and regulations for the control of wireless in the following countries, excepting those of which particulars will be found under a more general heading (*e.g.*, *Bahamas* included in *British West Indies*). In most cases it is assumed that the regulations in force in the countries owning or controlling the wireless stations are applicable and that it has not yet been deemed necessary to formulate any local regulations.

ABYSSINIA (see Maps 25, 29 and 30). The station at Gambela is controlled by the Sudan Government.

ADMIRALTY ISLANDS (see Maps 17 and 22). The station at Manus is controlled by the Australian Commonwealth.

ÆGEAN ISLANDS (see Maps 3 and 4). The stations at Chios and Samoa are controlled by Greece. Those at Rhodes and Stampalia, in the Dodecanese Islands, by Italy.

ALASKA. See under UNITED STATES OF AMERICA. (Maps 34, 36 and 42.)

ALBANIA (see Maps 3 and 14). An independent State governed by a Council of Regents. The station at Sasseno is controlled by the Italian Government. A station at Tirana is contemplated.

ALGERIA. See under FRANCE. (Maps 24, 26 and 28.)

ARABIA (see Maps 16, 25 and 27). With the exception of the stations in the British Protectorate at Aden and at Bahrein on the Arabian side of the Persian Gulf, there are no wireless stations in Arabia.

ASCENSION ISLAND (see Maps 24 and 33). Under the control of the Admiralty. The wireless telegraph station is now dismantled.

AZORES. See under PORTUGAL. (Maps 24 and 33.)

BAHAMAS. See under BRITISH WEST INDIES. (Maps 35, 45 and 46.)

BAHREIN ISLANDS. See under PERSIAN GULF (Maps 16 and 21).

BATHURST. See under GAMBIA (Maps 24 and 26).

BRITISH EAST AFRICA. See under KENYA COLONY and ZANZIBAR (Maps 25, 28, 30 and 33).

CAMEROONS (see Maps 24 and 26). There are at present no stations in British Cameroons. For French Cameroons see under FRANCE. The station at Douala is under French control.

CANARY ISLANDS. See under SPAIN (Maps 24 and 30).

CAPE VERDE ISLANDS. See under PORTUGAL (Maps 24 and 33).

COCOS - KEELING ISLANDS. See under STRAITS SETTLEMENTS (Map 22).

CRETE. See under GREECE (Maps 3 and 14).

CURACAO. See under DUTCH WEST INDIES (Maps 45, 48 and 50).

CYRENAICA (see Maps 25 and 27). The North Eastern portion of Italian Libya. The stations at Bengasi, Cirene, Derna and Tobruk are owned and controlled by Italy.

DODECANESE (see Maps 3 and 14). The Sporadi group of the Aegean Islands, the stations in Rhodes and Stampalia, are owned and controlled by Italy.

DUTCH EAST INDIES. See under HOLLAND. (Maps 17 and 22).

DUTCH GUIANA. See under DUTCH WEST INDIES (Maps 48 and 51).

ERITREA (see Maps 25 and 29). An Italian Colony. The station at Assab, Massawa and Mersa Fatma are controlled by the Italian Government.

FAROE ISLANDS. See under DENMARK (Maps 2 and 15).

FERNANDO PO. See under SPAIN (Maps 24 and 26). The station of S. Isabel di Fernando Po is controlled by the Spanish Foreign Office.

FIUME (see Maps 2 and 13). An independent state, North-East of Pola, in the Adriatic Sea. A $1\frac{1}{2}$ kW. station was opened for public service on November 5th, 1923, and normally exchanges commercial traffic with Rome, Budapest and Vienna.

FRENCH EQUATORIAL AFRICA (see Maps 24, 25, 26 and 29), including French Congo and French Cameroon). The stations at Loango and Douala are owned and controlled by France.

FRENCH GUIANA. See under FRANCE (Maps 48 and 51).

FRENCH INDO-CHINA. See under FRANCE (Maps 17 and 23).

FRENCH SETTLEMENTS IN OCEANIA (see Map 56). Including Society Islands, Marquesar Islands, Tuamotu group, Leeward Islands, Gambier, Tubuai and Rapa Islands and Tahiti. The stations at Makatea and Papeete are owned and controlled by the French.

FRENCH SOMALILAND (see Maps 25, 29 and 30). The station at Jibuti is owned and controlled by the French.

FRENCH WEST AFRICA (see Maps 24 and 26). The territories are administered by a Governor-General assisted by a Council. Stations at Conakry, Dakar, Grand Bassam, Port-Etienne, Rufisque Tabu and Cotonou.

(For the Laws and Regulations controlling Wireless Telegraphy in the above French Colonies see under FRANCE and ALGERIA.)

FRIENDLY ISLANDS. See under PACIFIC ISLANDS (Map 56).

GUADELOUPE (see Map 45). A French Dependency in the Lesser Antillos. Destrellan Station communicates with Fort de France and Trinidad.

GUAM (see Map 22). An Island in the Pacific at the Southern extremity of the Mariana Archipelago. The station is owned and controlled by the United States Navy.

GUATEMALA (see Maps 35, 43 and 44). An Independent Republic, having a private Government station in Guatemala City.

HAITI (see Maps 35 and 45). The Republic has passed no regulations affecting telegraphy. The stations are controlled by the United States.

HAWAIIAN ISLANDS (Sandwich Islands) (see Map 56). Are owned and controlled by the United States. Private stations are regulated by the Department of Commerce and Naval stations by the U.S. Navy.

IRAQ. See MESOPOTAMIA (Maps 16 and 21).

ITALIAN SOMALILAND. See under ITALY (Maps 25, 28 and 30).

JAMAICA. See under BRITISH WEST INDIES (Maps 35 and 45).

LABRADOR. See under NEWFOUNDLAND (Maps 34 and 37).

LUXEMBOURG (see Maps 2 and 11). The Grand Duchy of Luxembourg has not adhered to the London Radiotelegraph Convention, but has made a declaration to the Berne Bureau in accordance with Article 48 of that Convention.

MACAO (see Maps 17 and 20). A Portuguese Colony with a station at São Francisco.

MADAGASCAR (see Maps 25 and 31). Including Mayotte and the Comoro Islands. A French Colony. See under FRANCE.

MALAY STATES not included in the Federation. Including Johore, Kedah, Perlis, Kelantan and Trengganu, are under British Protection (see Maps 17, 22 and 23).

MARSHALL ISLANDS (see Map 56). See under PACIFIC ISLANDS. The Nauru Station on Pleasant Island is controlled by the Australian Commonwealth.

MARTINIQUE (see Maps 35 and 45). A French Colony under the Administration of a Governor. The station at Fort de France is owned and controlled by the French Navy.

NEPAL (see Maps 17, 18 and 20). An independent Kingdom. There are at present no wireless stations, but a project is under consideration.

NEW BRITAIN. See under NEW GUINEA.

NEW GUINEA (see Maps 17 and 32). Including Papua, New Britain, New Ireland, the Admiralty Islands, Solomon Islands, Hermit Islands, Naurii Islands, Kaiser Wilhelm's Land and Bismarck Archipelego. Under the Administration of the Australian Commonwealth.

NEW IRELAND. See under NEW GUINEA.

PORTUGUESE EAST AFRICA (see under MOZAMBIQUE).

PORTUGUESE GUINEA (see Maps 24 and 26). A Portuguese Colony on the West Coast of Africa, South of Gambia. Stations have recently been opened at Bissau and Bolama.

RUSSIA (see Maps 3, 12, 16, 17 and 19). Wireless telegraphy is extensively used throughout Russia and a large number of stations have been opened during the past year. We have not been able to obtain particulars for the Laws and Regulations now governing the use of wireless telegraphy. Reference to the 1921 Edition of the Year Book will give such Statutes and Regulations as were in existence under the late Imperial Government.

S. PIERRE AND MIQUELON (see Maps 34 and 37). A French Colony on two groups of islands South of Newfoundland, the station on S. Pierre Island, and at Miquelon are under French control.

SAMOAN ISLANDS (see Map 56). The station at Apia is owned and controlled by the New Zealand Administration, those at Ofu, Tau and Tutuila by the United States.

SARAWAK. See under BRITISH NORTH BORNEO (Maps 17 and 22).

SERB, CROAT AND SLOVENE STATE (YUGO-SLAVIA) (see Maps 2, 3, 13 and 14). A kingdom formed by the fusion of Serbia, Montenegro, Bosnia and Herzegovina. We have been unable to obtain any information regarding the Laws and Regulations, if any, governing wireless in this Kingdom.

SOLOMON ISLANDS. See under NEW GUINEA (Maps 17 and 22).

SPITZBERGEN (including Bear Island). See under NORWAY (Maps 2, 9 and 15). The station at Green Harbour, Spitzbergen, is controlled by the Norwegian Government. There are several private stations, including one on Bear Island owned by the Bear Island Code Company of Tromsø.

SWAZILAND (see Maps 25 and 32) is under the Administration of the High Commissioner for South Africa.

SYRIA AND LEBANON (see Maps 3, 16 and 25). An independent State at present under a High Commissioner. A station has recently been opened for public service at Beyrouth.

TIMOR (see Map 22). This island in the Malay Archipelago is divided between Holland and Portugal. The station at Koepang, the South-Western extremity, is owned by the Dutch, and Dili, on the North Coast, by the Portuguese.

TONGA ISLANDS. See under PACIFIC ISLANDS (Map 56). The station at Nukualofa is owned by the Government of Tonga.

TRIPOLITANA AND CYRENAICA (see Maps 24, 25, 26 and 27). Italian Libia is, for administration purposes, divided into the districts of Tripolitana and Cyrenaica, each under a governor. The stations are controlled by the Italian Government.

TURKEY (see Maps 3, 14 and 16). We have been unable to obtain any information relating to the organisation and administration of wireless in Turkey.

VIRGIN ISLANDS (see Map 45). The stations on the Islands of S. Thomas and S. Croix are owned and controlled by the United States Navy.

WINDWARD PASSAGE (see Map 45). The station on Navassa Island is owned and controlled by the United States.

YUGO-SLAVIA. See above, under SERBS, CROATS and SLOVENES (Maps 2, 3, 13 and 14).

RADIOTELEGRAPHIC CONVENTION OF LONDON.

ADDITIONAL ADHERENTS.

In addition to the countries enumerated in the list on pages 22 and 23, the following have signified their adhesion to the terms of the International Convention :—

Cameroons (French Mandate)	.. .. .	7th March, 1923.
Estonia	.. .. .	1st July, 1923.
Réunion	.. .. .
Brunei	.. .. .	13th September, 1923.
Switzerland	.. .. .	26th February, 1923.

Syria, Lebanon and Iraq have signified their wish to abide by the terms of the Convention and Fiume will adopt the regulations relating to transmission and communications.

This information was received too late to be embodied in the lists on pages 22 and 23.

**DIRECTORY OF
THE WORLD'S
WIRELESS LAND
STATIONS AND
AIRCRAFT
STATIONS**

LAND STATIONS.

ABBREVIATIONS.

T—Radiotelephony only.
(T)—Radiotelephony in addition to Radiotelegraphy.
D F—Direction-Finding Stations.

NOTES.

1. Station under Construction.
2. Station temporarily closed.
3. Station projected.

For notes relating to countries marked (a) etc., see end of section.

N.B.—For Nature of Service refer to Alphabetical List of Call Signs.

Name.	Geographical Position. Meridian of Greenwich.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).
ADMIRALTY ISLANDS. (See under NEW GUINEA (TERRITORY OF))					
AEGEAN ISLANDS					
DODECANESE					
Rodi	36° 27' 10" N. 28° 15' 35" E.	ICW	270	Italian Government ..	300, 600
Stampalia	—	IDA	—	Italian Army ..	—
ALASKA. (See under U.S.A.)					
ALBANIA					
Saseno	Island of the East Coast of the South Adriatic Sea. 40° 29' 52" N. 19° 17' 17" E.	IDB	—	Italian Army	—
ALGERIA. (See under FRANCE)					
ANGOLA					
PORTUGUESE WEST AFRICA					
Ambriz	07° 52' 09" S. 13° 04' 50" E.	CRP	200	—	600, 900, 1,200
Baja dos Tigres ..	16° 32' 20" S. 11° 42' 50" E.	CRR	200	—	600, 900, 1,200
Cabinda	05° 32' 00" S. 12° 11' 00" E.	CRQ	250	Government	600, 900, 1,200
Camacupa	12° 02' 00" S. 17° 15' 00" E.	CRLP	250	—	900, 1,200
Dundo	07° 22' 30" S. 20° 58' 30" E.	CRLO	150	—	2,100
Huambo	12° 45' 00" S. 15° 49' 00" E.	CRLI	250	Government	900, 1,200
Loanda	08° 48' 30" S. 13° 15' 18" E.	CRL	750	Government	600, 900, 1,200, 1,600, 2,000
Lobito	12° 18' 50" S. 13° 35' 30" E.	CRO	250	Government	600, 900, 1,200
Lubango	14° 54' 00" S. 15° 34' 00" E.	CRLN	250	—	900, 1,200

ANGOLA—*contd.*

Malange	09° 32' 56" S. 16° 21' 00" E.	CRLM	250	Government .. .	900, 1,200
Mossamedes .. .	15° 11' 13" S. 12° 09' 17" E.	CRM	250	Government .. .	600, 900, 1,200
Novo Redondo ..	11° 07' 00" S. 13° 54' 00" E.	CRN	250	Government .. .	600, 900, 1,200
S. Antonio do Zaire..	06° 07' 30" S. 12° 18' 00" E.	CRLQ	200	—	600, 900, 1,200
Vila Henrique de Car- valho (Saurimo)	09° 39' 25" S. 20° 24' 00" E.	CRLS	200	—	600, 900, 1,200

ARGENTINE
REPUBLIC

Año Nuevo	Año Nuevo Island 54° 39' 25" S. 64° 03' 10" W.	LIO	432	Ministerio de Marina	600, 1,800
Buenos Aires .. .	—	LIA	—	Ministerio de Marina	—
Cabo de las Virgenes	Entrance to the Strait of Magellan 52° 20' 00" S. 68° 22' 00" W.	LJE	270	Ministerio de Marina	600, 800
Colegio Militar (Mili- tary College)	Buenos Aires 34° 34' 00" S. 58° 33' 00" W.	LNG	40	Ministerio de Guerra	400
Comando 1ra Division Ejercito (Comm. 1st Army Division)	Buenos Aires 34° 34' 00" S. 58° 36' 00" W.	LNR	40	Ministerio de Guerra	400
Comando 2da Division Ejercito (Comm. nd Army Division)	Buenos Aires 34° 33' 00" S. 58° 41' 00" W.	LNS	40	Ministerio de Guerra	400
Comodoro Rivadavia (Com. Inland Water- ways)	Gulf of St. George 45° 49' 00" S. 67° 35' 00" W.	LIJ	270	Ministerio de Marina	600, 800
Cordoba ¹	Cordoba 31° 26' 00" S. 64° 11' 00" W.	LNC	1,000	Ministerio de Guerra	—
Corrientes LIG ¹ ..	—	LIG	—	Ministerio de Marina	—
Corrientes LPC ..	Corrientes 27° 27' 52" S. 58° 50' 38" W.	LPC	100	Ministerio de Obras Publicas	1,000
Dársena Norte ..	North Entrance to the Port of Buenos Aires 34° 35' 35" S. 58° 22' 10" W.	LIH	432	Ministerio de Marina	600, 800
Direccion General de Arsenales de Guerra (Dir. Gen. of Arsenals)	Buenos Aires 34° 38' 00" S. 58° 24' 00" W.	LNA	40	Ministerio de Guerra	400
Eldorado, Misiones	26° 38' 00" S. 54° 43' 00" W	LIT	270	Ministerio de Marina	600, 1,000, 1,500
Faro San Antonio (S. Antonio Light) ¹	Buenos Aires 36° 18' 24" S. 56° 46' 25" W.	LJA	—	Ministerio de Marina	—
Formosa	Formosa 26° 14' 00" S. 58° 07' 00" W.	LIU	270	Ministerio de Marina	600, 1000, 1,500
Gallegos ¹	—	LIC	—	Ministerio de Marina	—
Interseccion Rio de la Plata Ponton (Intern. R. Plata Ponton)	Anchored near Buoy K37 of the Port of Buenos Aires	LJL	30	Ministerio de Marina	300, 600
Liniers	Buenos Aires 34° 38' 00" S. 58° 33' 00" W.	LNL	40	Ministerio de Guerra	400
Martin Garcia ..	34° 11' 15" S. 58° 15' 00" W.	LIY	100	Ministerio de Marina	300, 600
Mendoza	Mendoza 32° 54' 00" S. 68° 50' 00" W.	LNM	400	Ministerio de Guerra	600, 1,200
Monte Grande	34° 45' 14" S. 58° 33' 46" W.	LPZ	—	—	6,400 27,500 C.W. Alt.

Palomar (El)	..	Buenos Aires 34° 36' 00" S. 58° 36' 00" W.	LND	40	Ministerio de Guerra	400
Parana	..	Entre-Rios 31° 42' 00" S. 60° 29' 00" W.	LPB	275	Ministerio de Obras Publicas	600
Paz (La)	..	Entre Rios 30° 44' 00" S. 59° 39' 00" W.	LIW	270	Ministerio de Marina	450, 600
Posados	Misiones	27° 22' 00" S. 55° 54' 00" W.	LIV	270	Ministerio de Marina	300, 600
Posados	(Posados Missions)					
Practicos	Recalada,	Rio de la Plata 35° 10' 20" S. 56° 18' 30" W.	LJK	100	Ministerio de Marina	300, 600
	Rio de la Plata					
	Ponton					
Puerto Aguirre	..	Rio Iguazd 25° 35' 00" S. 54° 35' 00" W.	LIS	270	Ministerio de Marina	300, 600
Puerto Belgrano	..	Bahia Blanca 38° 53' 30" S. 62° 06' 15" W.	LII	430	Ministerio de Marina	600, 1,000
Puerto Bermejo	..	Formosa 26° 56' 25" S. 58° 35' 35" W.	LPD	100	Ministerio de Obras Publicas	700
Punta Delgada	Chubut	Valdes Peninsular 42° 45' 59" S. 63° 38' 22" W.	LJC	270	Ministerio de Marina	300, 600
Punta Mogotes		Buenos Aires 38° 05' 25" S. 57° 32' 45" W.	LJB	270	Ministerio de Marina	300, 600
	(Mogotes Point)					
Recalada	Bahia	Entrance to Bahia Blanca 39° 11' 00" S. 61° 39' 00" W.	LJM	50	Ministerio de Marina	300, 600
	Blanca Ponton Faro					
	(Regalada Bahia					
	Blanca Lightship)					
Rio Grande	..	Tierra del Fuego 53° 47' 10" S. 67° 45' 50" W.	LJF	270	Ministerio de Marina	300, 600
Rio Santiago	..	Buenos Aires 34° 50' 20" S. 57° 53' 45" W.	LIZ	270	Ministerio de Marina	600
Rosario de Santa Fé		32° 52' 00" S. 60° 39' 00" W.	LPA	100	Ministerio de Obras Publicas	900
San Julian	..	Santa Cruz 49° 18' 30" S. 67° 42' 53" W.	LJD	70	Ministerio de Marina	300, 600
Trelew	..	—	LIB	—	Ministerio de Marina	—
Tucuman	..	Tucuman 26° 51' 00" S. 65° 18' 00" W.	LNT	1,000	Ministerio de Guerra	—
Ushuaia	..	Tierra del Fuego 54° 48' 50" S. 68° 20' 00" W.	LIK	324	Ministerio de Marina	300, 600
Zarate	..	Buenos Aires 34° 06' 00" S. 59° 02' 00" W.	LIX	270	Ministerio de Marina	600, 800
AUSTRALIAN COMMONWEALTH						
Adelaide Radio	..	South Australia 34° 52' 00" S. 138° 31' 00" E.	VIA	450	Government ..	300, 450, 600
Brisbane Radio	..	Queensland 27° 25' 40" S. 153° 07' 55" E.	VIB	450	Government ..	300, 450, 600
Broome Radio	..	Western Australia 18° 00' 00" S. 122° 28' 00" E.	VIO	450	Government ..	300, 450, 600
Cooktown Radio	..	Queensland 15° 28' 00" S. 145° 15' 00" E.	VIC	450	Government ..	300, 450, 600
Darwin	..	Northern Territory 12° 27' 00" S. 130° 48' 00" E.	VID	450	Government ..	300, 450, 600
District Naval Office,		42° 52' 00" S. 147° 19' 00" E.	VZDM	—	Navy ..	—
Hobart						

**AUSTRALIAN
COMMONWEALTH**

—contd. (a)

Esperance Radio ..	Western Australia 33° 51' 00" S. 121° 53' 00" E.	VIE	450	Government	300, 450, 600
Flinders Island Radio	Tasmania 40° 01' 00" S. 147° 52' 00" E.	VIL	450	Government	300, 450, 600
Geraldton Radio ..	Western Australia 28° 47' 00" S. 114° 36' 30" E.	VIN	450	Government	300, 450, 600
Hobart Radio ..	Tasmania (Queen's Domain) 42° 52' 00" S. 147° 19' 00" E.	VIH	300	Government	300, 450, 600
King Island Radio ..	Tasmania Bass Strait 39° 55' 00" S. 143° 51' 00" E.	VZE	200	Government	300, 450, 600
Melbourne Radio ..	Victoria 37° 50' 00" S. 144° 58' 45" E.	VIM	450	Government	300, 450, 600
Naval Staff Office, Adelaide	34° 52' 00" S. 138° 31' 00" E.	VZDG	—	Navy	—
Naval Staff Office, Brisbane	27° 25' 40" S. 153° 07' 55" E.	VZDF	—	Navy	—
Naval Staff Office, Perth	32° 02' 00" S. 115° 51' 00" E.	VZDJ	—	Navy	—
Naval Staff Office, Port Melbourne	37° 50' 00" S. 144° 58' 45" E.	VZDB	—	Navy	—
Naval Staff Office, Sydney	33° 40' 00" S. 151° 00' 00" E.	VZDC	—	Navy	—
Perth Radio ..	Western Australia 32° 02' 00" S. 115° 51' 00" E.	VIP	400, 1,500	Government	300, 450, 600, 1,800-3,500 c.w.
Rockhampton Radio	Queensland 23° 24' 00" S. 150° 33' 00" E.	VIR	450	Government	300, 450, 600
Sydney Radio ..	New South Wales 33° 40' 00" S. 151° 00' 00" E.	VIS	400, 1,500	Government	300, 450, 600, 1,800-3,500 c.w.
Thursday Island Radio	Queensland, Torres Strait 10° 35' 00" S. 142° 13' 00" E.	VII	500	Government	300, 450, 600
Townsville Radio ..	Queensland 19° 15' 00" S. 146° 50' 00" E.	VIT	400, 1,500	Government	300, 450, 600, 1,800-3,500 c.w.
Willis Islets .. (see note a)	16° 17' 00" S. 149° 59' 00" E.	CGI	300-600	Government	300, 600
Wyndham Radio ..	Western Australia 15° 35' 00" S. 128° 18' 00" E.	VIW	450	Government	300, 450, 600

AZORES. (See under
PORTUGAL)**BAHAMAS.** (See un-
der **BRITISH
WEST INDIES**)**BAHREIN.** (See under
PERSIAN GULF)**BARBADOS.** (See
under **BRITISH
WEST INDIES**)**BATHURST.** (See
under **GAMBIA**)**BELGIAN CONGO**

Banana	Lower Congo 05° 59' 35" S. 12° 20' 02" E.	ONA	—	Posts and Telegraph Office Boma	300, 600, 2,250 frk.
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BELGIUM

Antwerp Radio ..	51° 13' 42" N. 04° 24' 00" E.	OSA	100-150	Government	800, 800
Brussels	—	BAV	—	—	—
Brussels Haren- Aerodrome	—	OPVH	—	—	—
Ostend Aerodrome ..	—	OPVO	—	—	—
Ostend Radio ..	51° 13' 24" N. 02° 55' 06" E.	OST	Day 250 500 Night 500 1,000	Government	300, 450, 800, 300, 600, 800, 1,800 spk.
Uccle, Brussels- Institut Meteoro- logique	—	OPO	—	—	—
Westhinder Light- ship	51° 22' 30" N. 02° 26' 26" E.	OTW	100-150	—	300, 800

BERMUDA

Bermuda Dockyard	32° 20' 00" N. 64° 45' 00" W.	BZB	200	British Admiralty ..	600, 1,600
Somerset Island ² ..	32° 20' 00" N. 64° 25' 00" W.	BZR	—	—	—

BOLIVIA

Ballivián	On the Pilcomayo 22° 42' 00" S. 62° 11' 00" W.	CPA	Day 200	—	600, 900
Cobija	On the Aquiri 11° 01' 00" S. 68° 50' 00" W.	CPG	Day 160	—	1,500, 2,600
D'Orbigny	On the Pilcomayo 22° 52' 00" S. 62° 00' 00" W.	CPB	—	—	600, 900
Esteros	On the Pilcomayo 23° 52' 00" S. 61° 20' 00" W.	CPD	Day 200	—	600, 900
Riberalta	On the Beni 10° 59' 00" S. 66° 04' 00" W.	CPE	Day 430	—	2,212, 3,311
S. Ana	On the Yacuma 13° 44' 00" S. 65° 35' 00" W.	CPJ	—	—	2,600
Todos Santos Trinidad	On the Chapare Bolivia On the Chapare 15° 50' 00" S. 64° 56' 00" W.	— CPI	— —	— —	— 2,600
Viacha	17° 25' 00" S. 68° 17' 00" W.	CPF	—	—	2,600 3,300
Villa Bella	Bolivia At the Conflu- ence of the Beni and the Mamore 10° 10' 00" S. 65° 10' 00" W.	CPH	—	—	—
Yacuiba	21° 58' 00" S. 63° 40' 00" W.	CPC	—	—	600, 900, 2,800, 3,300

BRAZIL

Abrolhos	Bahia 17° 57' 30" S. 38° 41' 46" W.	SNN	100	Navy	300
Amaralina ²	Bahia 13° 01' 00" S. 38° 28' 00" W.	SPA	400	Government	300, 800
Anhatomirim	S. Catharina 27° 25' 32" S. 48° 34' 20" W.	SOD	600	Navy	600, 1,000, 2,000

BRAZIL—contd.

Armacão	Rio de Janeiro Bay 22° 52' 57" S. 43° 08' 04" W.	SNW	50	Navy	300
Belém	Pará 01° 26' 59" S. 48° 30' 06" W.	SPB	400	Government	1,800
Cape St. Thomé ..	Rio de Janeiro (State) 22° 02' 00" S. 40° 58' 35" W.	SPT	750	Government	300, 600
Cruzeiro do Sul ..	District of Acre 07° 38' 28" S. 72° 36' 15" W.	SQC	400	Government	1,000 3,000
Fernando de Noronha	03° 50' 30" S. 32° 25' 12" W.	SPN	1,000	Navy	300, 600, 1 800
Fortaleza da Lage (Fort Lage)	Rio de Janeiro Bay 22° 56' 03" S. 43° 09' 00" W.	PTL	150	Ministry of War ..	450, 900
Fortaleza de Imbuhy (Fort Imbuhy)	Rio de Janeiro (State) 22° 57' 02" S. 43° 06' 56" W.	PTI	150	Ministry of War ..	450, 900
Fortaleza De Santa Cruz (Fort Ste. Cruz)	Rio de Janeiro Bay 22° 56' 03" S. 43° 08' 00" W.	PTC	150	Ministry of War ..	450, 900
Fortaleza de S. Joao (Fort S. Joao)	Rio de Janeiro Bay 22° 56' 40" S. 43° 09' 12" W.	PTJ	150	Ministry of War ..	450, 900
Ilha Das Cobras (Cobras I.)	Rio de Janeiro Bay 22° 52' 00" S. 43° 09' 00" W.	SNI	150	Navy	600
Ilha de Mocangue (Mocangue I.)	Rio de Janeiro Bay 22° 52' 15" S. 43° 07' 58" W.	SOQ	50	Navy	300
Ilha Do Boqueirão (Boqueirão I.)	Rio de Janeiro Bay 22° 46' 24" S. 43° 09' 39" W.	SNQ	50	Navy	300
Ilha Do Governador (Governador I.)	Rio de Janeiro Bay 22° 49' 25" S. 43° 07' 58" W.	SOH	800	Navy	600, 1,800, 2,000
Ilha Raza (Raza I.) ..	Entrance to the Bay of Rio de Janeiro 23° 03' 40" S. 43° 08' 45" W.	SNZ	150	Navy	600
Juncção	Rio Grande do Sul 32° 04' 00" S. 52° 07' 00" W.	SPJ	750	Government	300, 600
Labrea	Amazonas	SQL	—	Government	1,000 2,000
Ladario	Matto Grosso on the Paraguay	SNU	—	Navy	1,800
Manaos	Amazonas 03° 08' 05" S. 60° 01' 45" W.	SQM	750	Government	2,400, 3,500
Mont'Serrat	Near Santos 23° 56' 27" S. 46° 19' 34" W.	SPS	200	Government	300, 600
Natal Norte	Rio Grande do Norte	SNR	—	Navy	600
Niotheroy	Rio de Janeiro (State) 22° 52' 52" S. 43° 07' 40" W.	PTN	150	Ministry of War ..	450, 600, 900
Olinda Pernambuco	Near Pernambuco 08° 00' 35" S. 34° 51' 00" W.	SPO	590	Government	300, 600

BRAZIL—contd.

Porto Velho ..	Matto Grosso 08° 46' 00" S. 63° 55' 00" W.	SQV	750	Government ..	2,400 3,500
Quartel General ..	Rio de Janeiro 22° 54' 25" S. 43° 11' 30" W.	PTQ	150	Ministry of War ..	450, 600, 900
Rio Branco ..	Acre 09° 58' 28" S. 67° 52' 05" W.	SQR	210	Government ..	1,000 2,000
Rio de Janeiro ..	22° 55' 40" S. 43° 10' 10" W.	SPY	200	—	300, 600
Santarém ..	Para 02° 24' 48" S. 54° 42' 58" W.	SQS	400	Government ..	2,000 3,000
Senna Madureira ..	District of Acre 09° 03' 57" S. 68° 39' 35" W.	SQN	400	Government ..	1,500 3,000
S. Luiz do Maranhão	—	SOM	—	Navy ..	600
Tarauacá ..	District of Acre 08° 20' 55" S. 70° 43' 30" W.	SQT	210	Government ..	1,500, 3,000
Villa Militar ..	Rio de Janeiro 22° 49' 27" S. 43° 24' 27" W.	PTV	150	Ministry of War ..	450, 600, 900
Villegaignon ..	Rio de Janeiro Bay 22° 52' 00" S. 43° 09' 40" W.	SNV	27	Navy ..	850
Xapury ..	District of Acre 10° 39' 10" S. 68° 36' 30" W.	SQX	210	Government ..	1,000 2,000

**BRITISH EAST
AFRICA.** (See under
**KENYA
COLONY** and
**PROTECTORATE
ZANZIBAR,** and
PEMBA)

BRITISH GUIANA

Demerara ..	06° 49' 00" N. 58° 11' 17" W.	BZL	500	British Admiralty ..	600, 1,400, 1,800
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**BRITISH
HONDURAS**

Belize ..	17° 30' 35" N. 88° 11' 17" W.	VPP	400	Government ..	300, 600, 1,000 1,500 c.w.
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BRITISH INDIA

Allahabad Radio ..	25° 26' 00" N. 81° 55' 00" E.	VWA	—	—	2,300
Bombay Radio ..	18° 57' 31" N. 72° 54' 13" E.	VWB	350	Indian Government ..	300, 600, 1,000 2,000
Calcutta Radio ..	22° 33' 31" N. 88° 20' 16" E.	VWC	350	Indian Government ..	300, 600, 1,000 2,000
Delhi Radio ..	23° 39' 15" N. 77° 14' 30" E.	VWD	—	—	2,700
Jutogh Radio ..	31° 06' 15" N. 77° 06' 30" E.	VWJ	—	—	1,400, 2,300 c.w.
Karachi Radio ..	24° 51' 05" N. 67° 02' 32" E.	VWK	350	Indian Government ..	300, 600, 1,000, 2,000, 3,500
Lahore Radio ..	31° 30' 00" N. 74° 24' 00" E.	VWL	—	—	1,900
Madras Radio ..	12° 59' 17" N. 80° 10' 56" E.	VWM	350	Indian Government ..	600, 800, 1,000
Maymyo Radio ..	22° 01' 45" N. 96° 29' 12" E.	VTM	—	—	3,000
Mhow Radio ..	22° 32' 55" N. 75° 45' 23" E.	VWH	—	—	1,500
Nagpur Radio ..	21° 10' 00" N. 79° 05' 00" E.	VWN	—	—	2,600

BRITISH INDIA—*contd.*

Peshawar Radio ..	34° 02' 00" N. 71° 40' 00" E.	VWP	—	—	1,800
Poona Radio ..	18° 29' 58" N. 73° 55' 34" E.	VVO	—	—	1,100 C.W.
Port Blair ..	South Andaman Island 11° 39' 34" N. 92° 45' 36" E.	VTP	350	Indian Government ..	600, 1,200
Quetta Radio ..	30° 15' 00" N. 67° 00' 00" E.	VWQ	—	—	2,600
Rangoon Radio ..	Lower Burma 16° 45' 54" N. 96° 11' 42" E.	VTR	350	Indian Government ..	300, 600, 1,200
Secunderabad Radio	17° 32' 00" N. 78° 33' 00" E.	VWT	—	—	3,000
Victoria Point ..	Extreme South of Lower Burma 09° 59' 15" N. 98° 33' 15" E.	VTV	350	Indian Government ..	300, 600, 1,200

**BRITISH NORTH
BORNEO***(see note b)*

Jesselton ..	05° 56' 50" N. 116° 03' 10" E.	VQA	400	Government ..	600, 1,200, 3,000
Kudat ..	06° 52' 40" N. 116° 50' 15" E.	VQD	400	Government ..	600, 1,200, 2,850
Sandakan ..	05° 50' 00" N. 118° 06' 40" E.	VQB	400	Government ..	600, 1,200, 2,900
Silimpopon ..	04° 18' 00" N. 117° 25' 00" E.	VSN	50	—	1,800
Tawao ..	04° 14' 40" N. 117° 54' 00" E.	VQC	400	Government ..	600, 1,200, 2,700

BRUNEI

Brunei Radio ..	04° 51' 30" N. 114° 53' 30" E.	VSJ	100	—	2,300
Labuan Radio ..	05° 18' 00" N. 115° 14' 30" E.	VSK	100	—	2,300
Temburong Radio ..	04° 43' 00" N. 115° 50' 00" E.	VSL	100	—	2,300

SARAWAK

Goebilt (T) ..	01° 37' 50" N. 111° 27' 30" E.	VSD	80	Government ..	1,200
Kuching (T) ..	01° 33' 20" N. 110° 20' 35" E.	VQF	500	Government ..	600, 1,000, 1,200, 1,500, 1,800, 2,800, 3,200
Miri (T) ..	04° 26' 00" N. 114° 01' 00" E.	VQP	300	Government ..	600, 1,200, 1,800
Sadong (T) ..	01° 24' 10" N. 110° 45' 10" E.	VQW	150	Government ..	1,200
Sibu (T) ..	02° 16' 30" N. 111° 50' 30" E.	VQV	300	Government ..	1,200

**BRITISH
SOMALILAND**

Aden Radio ..	12° 49' 25" N. 45° 02' 09" E.	BZF	500	Government ..	600, 2,000
Berbera Radio ..	10° 26' 06" N. 45° 01' 28" E.	VPJ	250	Government ..	300, 600
Burao ..	09° 31' 40" N. 45° 33' 00" E.	VQX	—	Government ..	600
Hargeisa ..	09° 33' 00" N. 44° 01' 10" E.	VSA	—	Government ..	600
Las Dureh ..	10° 20' 00" N. 46° 00' 00" E.	VQY	—	Government ..	600

**BRITISH SOUTH-
WEST AFRICA**
(See under **SOUTH
AFRICA**)

BRITISH WEST INDIES**BAHAMAS**

Bimini	25° 44' 00" N. 79° 19' 00" W.	VSC	150	Government	300, 600, 952
Elbow Cay	Abaco 26° 32' 00" N. 76° 57' 00" W.	VSO	100	Government	300, 600, 952
Governors Harbour..	Eleuthera Island 25° 12' 00" N. 76° 16' 00" W.	VSE	100	Government	300, 600
Harbour Island ..	25° 30' 00" N. 76° 39' 00" W.	VSF	100	Government	300, 450, 600
Inagua	20° 57' 00" N. 73° 41' 00" W.	VSG	150	Government	300, 600, 952
Nassau	25° 05' 00" N. 77° 22' 30" W.	VPN	400	Government	300, 600, 1,800
Normans Castle ..	Abaco 26° 43' 00" N. 77° 26' 30" W.	VSP	100	Government	300, 450, 600

BARBADOS

Barbados	13° 04' 35" N. 59° 36' 27" W.	VPO	200	—	300, 600
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JAMAICA

Christiania ²	Jamaica	BZG	—	—	—
Kingston ²	17° 57' 43.6" N. 76° 47' 29.3" W.	VQI	100	—	600

ST. LUCIA

St. Lucia	Windward Isls. 14° 00' 11" N. 61° 00' 13" W.	VQH	250	—	300, 600
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TRINIDAD

Tobago	11° 10' 40" N. 60° 43' 04" W.	VPM	300	Government	600
Toco	Trinidad 10° 50' 00" N. 60° 55' 00" W.	VQG	150	Government	600
Trinidad	10° 38' 45" N. 61° 30' 49" W.	VPL	350	Government	600, 1,800

TURKS & CAICOS ISLANDS.

Grand Turk (T) ..	Turks and Caicos Islands 21° 28' 00" N. 71° 08' 00" W.	VSI	350	—	425 C.W.
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WINDWARD PASSAGE

Navassa Island ..	18° 24' 00" N. 74° 01' 00" W.	NKC	150	U.S. Dep of Commerce	565, 600
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BRUNEL. (See under BRITISH NORTH BORNEO)**BULGARIA**

Varna	43° 12' 00" N. 27° 55' 00" E.	LZF	270	Government	— 300, 600
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CAMEROONS

Douala	04° 03' 35" N. 09° 40' 50" E.	FKF	150, 400	—	600, 800 spark, 800, 1,000, 1,500 C.W.
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CANADA

(see note c)

Alert Bay	British Columbia, Queen Charlotte Sound, Cormorant Island 50° 35' 20" N. 126° 55' 35" W.	VAF	350	Government Depart- ment of Marine and Fisheries, -Ottawa (Ont.)	300, 600, 1,600
Belle Isle	Newfoundland Strait of Belle Isle 51° 52' 55" N. 55° 21' 50" W.	VCM	250	Government Depart- ment of Marine and Fisheries, Ottawa (Ont.)	300, 600

CANADA—contd.						
Bull Harbour ..	British Columbia, Hope Island 50° 55' 20" N. 127° 56' 20" W.	VAG	450	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Camperdown ..	Nova Scotia, Halifax 44° 31' 00" N. 63° 32' 45" W.	VCS	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Canso D.F. ..	Nova Scotia 45° 19' 24" N. 60° 58' 25" W.	VAX	100	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	800	
Cape Lazo ..	British Columbia, East Coast of Vancouver Island	VAC	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Cape Race ..	Newfoundland 46° 39' 10" N. 53° 05' 05" W.	VCE	500	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Cape Race, D.F. ..	Newfoundland 46° 39' 10" N. 53° 05' 05" W.	VAZ	250	Government	800	
Cape Sable ..	Nova Scotia 43° 23' 20" N. 65° 37' 15" W.	VCU	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Chebucto Head, D.F.	Nova Scotia 44° 30' 01" N. 63° 31' 20" W.	VAV	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	800	
Clarke City .. (c)	Province of Quebec, Nth Shore of River St. Lawrence 50° 12' 15" N. 66° 37' 36" W.	VCK	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Dead Tree Point ..	British Columbia, Queen Charlottes Island (Graham Island) 53° 21' 30" N. 131° 55' 55" W.	VAH	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Digby Island ..	British Columbia, Prince Rupert 54° 17' 05" N. 130° 22' 35" W.	VAJ	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Estevan ..	British Columbia, West Coast of Vancouver Isl. 49° 22' 05" N. 126° 32' 22" W.	VAE	500	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Fame Point .. (c)	Province of Quebec, Gulf St. Lawrence 49° 06' 50" N. 64° 36' 20" W.	VCG	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Father Point .. (c)	Province of Quebec, S. Shore of River St. Lawrence 48° 31' 00" N. 68° 27' 40" W.	VCF	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Glace Bay ..	—	GB	2,000	Marconi Co. of Canada	7,600 c.w.	
Gonzales Hill ..	British Columbia, Victoria 48° 24' 50" N. 123° 19' 25" W.	VAK	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600	
Grindstone Island ..	Gulf of St. Lawrence, Magdalen Islands 47° 23' 00" N. 61° 54' 20" W.	VCN	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Grosse Isle ..	Quebec, River St. Lawrence 47° 02' 00" N. 70° 40' 05" W.	VCD	100	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800	
Halifax Dockyard ..	Nova Scotia 44° 39' 30" N. 63° 35' 16" W.	VAA	—	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	—	

CANADA—contd.					
Heath Point Lightship	Quebec 49° 03' 00" N. 61° 30' 30" W.	VCI	150	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 800
Kingston	Ontario Barriefield Common 44° 14' 05" N. 76° 27' 30" W.	VH	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Louisburg .. No. 1 No. 2	Nova Scotia, Cape Breton Isl. 46° 09' 16" N. 59° 56' 48" W.	VAS	1,500	Marconi Co. of Canada	2,100, (rec.) 2,400, 2,600, 2,800 c.w.
Lurcher Lightship ..	Nova Scotia, off Lurcher Shoal 43° 49' 30" N. 66° 32' 00" W.	VDR	100	Government	300, 600
Midland	Georgian Bay, Ontario 44° 44' 40" N. 79° 51' 45" W.	VBC	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Montreal (c)	Quebec 45° 34' 05" N. 73° 38' 05" W.	VCA	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600
North Sydney ..	Cape Breton Isl., Nova Scotia, 46° 13' 10" N. 60° 14' 50" W.	VCO	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600
Pachena D.F. ..	Vancouver Is. 48° 40' 00" N. 125° 06' 00" W	VAD	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	800
Pas, (Le)²	Manitoba 53° 52' 45" N. 101° 21' 30" W.	VBM	600	Government Dept. of Railways and Canals, Ottawa (Ont.)	900, 1,800 , 2,400
Point Amour ..	Newfoundland, Strait of Belle Isle 51° 27' 25" N. 56° 50' 30" W.	VCL	150	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600
Point Edward ..	Ontario, to the South of Lake Huron 43° 00' 10" N. 82° 24' 55" W.	VBE	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Point Grey	British Columbia, near Vancouver 49° 15' 55" N. 123° 15' 20" W.	VAB	150	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Port Arthur.. ..	Ontario, Lake Superior, Thunder Bay 48° 26' 30" N. 89° 13' 45" W.	VBA	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Port Burwell ..	Ontario, Lake Erie 42° 38' 35" N. 80° 47' 14" W.	VBF	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600 , 1,600
Port Nelson² ..	Hudson Bay, Manitoba, Mouth of Nelson River 57° 03' 20" N. 92° 34' 30" W.	VCN	150, 600	Government Dept. of Railways and Canals, Ottawa (Ont.)	300, 600 , 1,800
Quebec	Port of Quebec 46° 48' 25" N. 71° 12' 25" W.	VCC	150	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600
St. Paul's Island D.F.	Nova Scotia Gulf of St. Lawrence 47° 12' 30" N. 60° 08' 45" W.	VAT	250	Government Dept. of Marine and Fisheries, Ottawa, (Ont.)	800
Sable Island.. ..	Nova Scotia 43° 56' 20" N. 60° 01' 40" W.	VCT	300	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 600
Sault Ste Marie ..	Ontario 46° 31' 05" N. 84° 17' 50" W.	VBB	350	Government	500, 600 , 1,600

CANADA—contd.

S. John D.F.	..	New Brunswick, Red Head 45° 15' 04" N. 66° 00' 47" W.	VAR	250	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	800, 800
S. John,	..	New Brunswick Red Head 45° 15' 04" N. 66° 00' 47" W.	VAR	200	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	800, 800
Tobermory	..	Ontario, Entrance of Georgian Bay 45° 15' 55" N. 81° 39' 40" W.	VBD	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600
Toronto	..	Lake Ontario, Toronto Island 43° 36' 50" N. 79° 23' 10" W.	VBG	350	Government Dept. of Marine and Fisheries, Ottawa (Ont.)	300, 800, 1,600

CANARY ISLANDS
(See under **SPAIN**)**CAPE VERDE IS.**
(See under **POR-
TUGAL**)**CEYLON**

Colombo Radio	..	06° 55' 14" N. 79° 52' 53" E.	VPB	390	Government ..	0, 600
Matara	..	05° 59' 00" N. 80° 32' 00" E.	BZE	—	—	000

CHATHAM ISLDS.
(See under **PACIFIC
ISLDS.**)**CHILE**

Antofagasta	..	23° 27' 35" S. 70° 31' 30" W.	CCB	400	Government ..	300, 800, 1,300
Arica	..	18° 29' 00" S. 70° 20' 35" W.	CCA	400	Government ..	300, 800, 1,300
Bories	..	51° 45' 00" S. 72° 32' 00" W.	CCV	300	—	300, 800, 1,300
Coquimbo	..	29° 57' 35" S. 71° 20' 00" W.	CCC	400	Government ..	300, 800, 1,300
Evangelistas *	..	52° 22' 30" S. 75° 05' 55" W.	CCY	—	—	300, 800
Felix ¹	..	52° 58' 00" S. 74° 05' 00" W.	CCZ	—	—	300, 800, 1,300
Huafu	..	Province of Llanquihue Huafo Island 43° 33' 37" S. 74° 49' 30" W.	CCQ	250	Government ..	300, 800, 1,300
Juan Fernandez	..	Juan Fernandez Island 33° 37' 30" S. 78° 49' 50" W.	CCD	250	Government ..	300, 800, 1,300
Llanquihue	..	41° 32' 00" S. 72° 55' 00" W.	CCO	2,000	Government ..	3,500, 5,000
Mocha (La)	..	38° 22' 12" S. 73° 53' 44" W.	CCN	200	Government ..	300, 800
Punta Arenas Aposta- dero *	..	53° 10' 00" S. 70° 50' 00" W.	CCX	—	—	300, 800, 1,300
Punta Arenas Catalina	..	53° 10' 00" S. 70° 50' 00" W.	CCW	2,000	—	3,500, 5,000
Raper	..	Taytao Peninsula 46° 49' 45" S. 75° 37' 30" W.	CCS	250	Government ..	300, 800, 1,300
Rio Aysen ¹	..	46° 49' 45" S. 75° 37' 30" W.	CCR	—	—	300, 80, 1,300
Santiago Espejo	..	33° 26' 00" S. 70° 38' 10" W.	CCI	—	—	—

CHILE—contd.

Santiago Moneda ..	33° 26' 00" S. 70° 38' 10" W.	CCG	300	—	300, 600, 1,300
Santiago Universidad (University)	33° 26' 00" S. 70° 38' 10" W.	CCH	—	—	—
Talcahuano Escuela de Torpedos (Torpedo School)	36° 44' 00" S. 73° 05' 35" W.	CCL	250	—	300, 600, 1,300
Talcahuano Rocuant	36° 44' 00" S. 73° 05' 35" W.	CCK	700	—	300, 600, 1,300
Valparaiso, P. Ancha	33° 01' 06" S. 71° 38' 06" W.	CCE	300	Navy	300, 600, 1,300

CHINA

Canton	23° 10' 00" N. 113° 20' 00" E.	XNP	Day 650 Night 1,300	Government	600, 1,200, 1,600, 2,100
Chefoo	37° 32' 00" N. 121° 20' 00" E.	XOF	Day 650 Night 1,300	Government ..	600, 1,200, 1,600, 2,100
Foochow	26° 07' 00" N. 119° 18' 00" E.	XOW	Day 650 Night 1,300	Government	600, 1,200, 1,600, 2,100
Kalgan	Chihli 40° 45' 00" N. 115° 29' 00" E.	XQL	Day 650 Night 1,300	Government	1,200, 1,600, 2,100, 3,000
Peking NPP ..	39° 55' 00" N. 116° 47' 00" E.	NPP	1,500	U.S. Marine Corps ..	875, 1,908, 3,950, 4,525 c.w.
Peking XPK ..	39° 54' 00" N. 116° 27' 00" E.	XPK	Day 650 Night 1,300	Government	600, 1,200, 1,600, 2,100
Quang-Tcheou-Wan	21° 03' 34" N. 110° 27' 45" E.	FWA	500	Government Admini- stration of French Indo China	300, 600, 1,800
Shanghai NPJ ..	31° 15' 00" N. 121° 29' 00" E.	NPJ	100	U.S. Navy	300, 600, variable
Shanghai	31° 15' 00" N. 121° 29' 00" E.	XSH	200	Government Telegraph Dept., Ministry of Communications, Peking	600
Shanghai-Zikawei ..	31° 11' 32" N. 121° 25' 48" E.	FFZ	Day 500 Night 1,000	Soc Francaise Radio- Electriques, Paris	750, 900, 1,800
Tientsin	—	WUQ	1,000	U.S. Army	600-1,000
Tsingtau	36° 03' 12" N. 120° 20' 00" E.	XRT	Day 1,000 Night 2,000	—	300, 600, 1,800, 2,800, 3,500, 4,000
Tsungming	Kiang Su 31° 30' 00" N. 121° 20' 00" E.	XSU	300	—	600
Woosung	Kiangsu 31° 21' 00" N. 121° 25' 00" E.	XSG	Day 650 Night 1,300	Government Telegraph Dept., Ministry of Communications, Peking	600, 1,200, 1,600, 2,100
Wuchang	Hupei 30° 30' 00" N. 114° 23' 00" E.	XOC	Day 650 Night 1,300	Government	600, 1,200, 1,600, 2,100, 3,000

CHRISTMAS ISLD.
(See under **STRAITS SETTLEMENTS**)**COCOS - KEELING ISLANDS.** (See under **STRAITS SETTLEMENTS**)**COLOMBIA (REPUBLIC OF)**

Cartagena	10° 40' 00" N. 75° 30' 00" W.	CTG	Day 600 Night 1,200	Government	600, 1,500, 2,000, 2,500, 3,000
Puerto Colombia ..	11° 02' 00" N. 75° 00' 00" W.	HJB	450	Marconi's Wireless Tele- graph Co., Ltd., London	600, 1,200,

CUBA (d)					
Baracoa	Province of Santiago de Cuba 20° 21' 46" N. 74° 29' 13" W.	PWE	300	Government	300, 750
Chaparra	Province of Santiago de Cuba 21° 12' 30" N. 76° 27' 40" W.	PWD	300	Government	300, 750
Fe (La)	Province of Pinar del Rio 22° 02' 00" N. 84° 14' 30" W.	PWG	300	Government	300, 3,800
Guantanamo (see note d)	Guantanamo Bay 19° 54' 38" N. 75° 08' 35" W.	NAW	300, 1,000	U.S. Navy	150, 600, 975, 1,870, 2,400, 2,726, 2,750, spk. 3,950, 4,525, c.w. 700, 2,800
Habana	23° 09' 26" N. 82° 21' 29" W.	PWA	1,000	—	—
Nueva Gerona	Isla de Pinos 21° 52' 30" N. 82° 42' 00" W.	PWB	400	Government	300, 600
Pinar del Rio	Province of Pinar del Rio 22° 25' 45" N. 83° 38' 20" W.	PWF	300	Government	300, 750
S. Clara	Province of Santa Clara 22° 24' 00" N. 79° 59' 30" W.	PWC	300	Government	300, 750
CURACAO. (See under DUTCH WEST INDIES)					
CYPRUS					
Famagusta	35° 08' 00" N. 33° 59' 00" E.	BXF	—	—	—
CYRENAICA. (See under TRIPOLI-TANA)					
CZECHOSLOVAKIA					
Prague (T)	—	OKP PRG	—	—	2,500-7,000, 6,000, 550-3,900, 2,500
DANZIG (FREE TOWN OF)					
Danzig	—	DG	—	—	1,950 c.w.
Danzig	Baltic Sea Coast 54° 20' 56" N. 18° 39' 08" E.	KAZ	Day 600 Night 1,000	—	300, 450, 600, 800, 1,800 (Spark)
DENMARK					
Anholt-Knob (Lightship)	Kattegat 56° 45' 58" N. 11° 51' 51" E.	OUR	100	—	300, 600
Blaavand Radio	North Sea Coast 55° 33' 29" N. 08° 05' 11" E.	OXB	Day 200 Night 500	Government	300, 450, 600 1,800
Copenhagen Radio	55° 40' 49" N. 12° 36' 32" E.	OXA	Day 200 Night 500	Government	300, 600, 1,800
Drogden (Lightship)	The Sound 55° 33' 03" N. 12° 42' 57" E.	OUW	15	Government	300, 600
Gilleleje-Flak N. (Lightship)	Kattegat 56° 09' 48" N. 13° 18' 00" E.	OUE	30	Government	300, 600
Gjedser	Falster Island 54° 34' 25" N. 11° 55' 48" E.	OXC	135	State Railways of Den- mark.	300, 450, 600, 800, 1,000

DENMARK—contd.

Gjedser Havn. ..	Baltic Sea 54° 32' 24" N. 11° 56' 20" E.	OXD	25	—	250
Gjedser Rev. (Lightship) ..	Baltic Sea 54° 27' 12" N. 12° 11' 00" E.	OUU	5	Government	300
Graadyb .. (Lightship) ..	North Sea 55° 20' 02" N. 08° 04' 41" E.	OUX	30	Government	300, 600
Horns Rev. .. (Lightship) ..	North Sea 55° 34' 06" N. 07° 19' 30" E.	OUZ	30	Government	300, 600
Laeso-Rende .. (Lightship) ..	Kattegat 57° 12' 48" N. 10° 41' 38" E.	OUK	100	Government	300, 600
Laeso Trindel .. (Lightship) ..	Kattegat 57° 26' 30" N. 11° 16' 45" E.	OUT	100	Government	300, 600
Lyngby Radio (T) ..	Zealand 55° 45' 57" N. 12° 28' 34" E.	OXE	—	State Telegraphs ..	2,400 T'py. 3,650, 4,650, 5,650 c.w. 300, 600
Schultz-Grund .. (Lightship) ..	Kattegat 56° 08' 54" N. 11° 11' 10" E.	OUC	100	Government	300, 600
Skagens Rev. .. (Lightship) ..	Skagerak 57° 46' 00" N. 10° 43' 20" E.	OUB	100	Government	300, 600
Vyl .. (Lightship) ..	North Sea 55° 23' 38" N. 07° 44' 13" E.	OUY	30	Government	300, 600
FAROE ISLANDS					
Thorshavn	62° 00' 52" N. 06° 46' 08" W.	OXJ	100	State Telegraphs ..	300, 500, 600
Tveraa	61° 33' 12" N. 06° 48' 00" W.	OXK	—	—	300, 500, 600

**DODECANESE. (See
under AEGEAN
ISLANDS)****DOMINICAN
REPUBLIC**

Romana (La) ..	18° 25' 00" N. 68° 57' 00" W.	HIB	300	Guanica Centrale ..	300, 600, 1,600
S. Domingo City ..	18° 27' 43" N. 69° 53' 15" W.	NJG	300	S. Domingo Govern- ment	600

DUTCH EAST INDIES

Amboina	Amboina Island 03° 47' 30" S. 128° 05' 00" E.	PKE	420	Government	600, 1,600, 2,300 spk.
Balikpapan Radio ..	Borneo 01° 16' 10" S. 116° 50' 45" E.	PKF	420	De Bataafsche Petro- leum Maatschappij	600, 2,000, 3,700, 3,300 spk.
Bima	Sumbawa 08° 27' 00" S. 118° 44' 00" E.	PKR	400	—	1,400 c.w.
Cteribon Radio ..	Jav 6° 4' 00" S. 108° 38' 37" E.	PKV	100	War Dept.	400, 600, 1,000 spk.
Dobo	Aru Islands 05° 45' 15" S. 134° 13' 00" E.	PKO	400	—	1,400, 2,400, c.w.
Endeh	Flores Island 08° 48' 00" S. 121° 40' 00" E.	PKQ	400	—	1,400 c.w.
Koepang Radio ..	Timor 10° 09' 30" S. 123° 35' 30" E.	PKD	420	Government	600, 1,600, 2,300 spk.
Malabar	Java 06° 56' 00" S. 107° 36' 00" E.	PKX	10,800	—	6,000, 8,800, 9,000, 12,000, 15,000 c.w.
Manokwari	New Guinea 00° 53' 34" S. 134° 06' 26" E.	PKK	400	—	1,400 c.w.

DUTCH EAST INDIES

— on d.

Neira Banda ..	Banda Island 04° 31' 53" S. 129° 53' 32" E.	PKJ	—	Government	1,400 c.w.
Sabang Radio ..	Sumatra Weh Island 05° 53' 50" N. 95° 20' 18" E.	PKA	Day 400 Night 800	Government	600 spk.
Semarang Radio ..	Java 06° 58' 00" S. 110° 25' 30" E.	PKN	100	—	300, 600 spk.
Sito bondo Radio ..	Java 07° 41' 20" S. 114° 05' 30" E.	PKC	420	Government	600, 1,600, 2,300 spk.
Soerabaja Radio ..	Java 07° 11' 55" S. 112° 41' 21" E.	PKH	400	Government Marine Dept.	600 spk.
Tarakan Radio ..	Island of Tarakan 03° 18' 25" N. 117° 36' 15" E.	PKG	300	De Bataafsche Petro- leum Maatschappij	800, 2,000, 3,700, 2,850 spk.
Tjilatjap Radio ..	Java 07° 44' 00" S. 109° 01' 00" E.	PKM	150	War Department ..	300, 400, 600, 1,200 spk.
Waingapoc	Sandalwood Island 09° 38' 00" S. 120° 12' 00" E.	PKU	400	—	1,400 c.w.
Wetlevreden Radio	Near Batavia 06° 12' 10" S. 106° 51' 55" E.	PKB	270	Government Marine Dept.	600 spk.

DUTCH GUIANA.
(See under **DUTCH
WEST INDIES**)**DUTCH WEST
INDIES****CURACAO**

Aruba	12° 31' 05" N. 70° 02' 01" W.	PJA	108	Government	600
Bonaire	12° 09' 20" N. 68° 16' 15" W.	PJB	108	Government	600
Curaçao	12° 06' 20" N. 68° 56' 28" W.	PJC	400	Government	300, 600, 1,800
St. Martin	18° 01' 04" N. 63° 04' 19" W.	PJD	650	Government	300, 600, 900, 1,200, 1,500 1,800, 2,400

SURINAM (e)
(DUTCH GUIANA)

Moengo	05° 37' 50" N. 54° 24' 50" W.	PJO	80	—	300, 450, 600
Paramaribo Radio ..	05° 49' 48" N. 55° 12' 13" W.	PJN	300	—	600, 800, 1,200 1,600, 1,800

ECUADOR

Esmeraldas	00° 58' 45" N. 79° 42' 00" W.	HCE	500	—	300, 600, 1,700
Guayaquil	02° 12' 00" S. 79° 50' 00" W.	HCG	900	—	300, 600, 2,500 3,200
Puná Guayas	02° 45' 00" S. 79° 53' 00" W.	HCP	100	—	600 c.w.
Quito	00° 13' 00" S. 78° 32' 00" W.	HCO	900	Government	600, 2,500, 3,200

EGYPT					
Abu Zabal Radio ..	Near Cairo 30° 16' 09" N. 31° 22' 10" E.	SUC	2,500	—	8,200, 10,000 c.w. 11,000 13,300
Alexandria Radio ..	31° 11' 53" N. 29° 51' 45" E.	SUH	450, 200.	Egyptian State Tele- graphs	300, 600, 800, 1,000, 1,200 1,800, 600
SUDAN					
Khartoum	15° 36' 32" N. 32° 31' 03" E.	SUL	2,000	Government	1,300-3,700, 3,000
Port Sudan Radio ..	19° 37' 05" N. 37° 12' 55" E.	SUD	250	Direction of Posts and Telegraphs of Soudan, Khartum	300, 600
<i>Local call</i>					
Akobo	—	AKR	100	Government	527-725, 700
Atbara	17° 41' 15" N. 33° 58' 43" E.	ATR	150	Government	300, 600
Fasher	13° 37' 33" N. 25° 21' 11" E.	FSR	200-250	Government	400-1,100, 900
Gambela	—	GMR	250-300	Government	600-900, 700
Geneina	—	GNR	200-250	Government	400-2,000, 900
Malakal	09° 33' 00" N. 31° 39' 00" E.	MLR	250-300	Government	600-900, 700
Mongalla	05° 11' 34" N. 31° 45' 56" E.	MGR	250-300	Government	400-1,100, 700
Nasser	08° 35' 30" N. 33° 03' 30" E.	NSR	250-300	Government	600-900, 700
Nyala	—	NYR	2-25	Government	400-1,100, 900
Wau	7° 41' 58" N. 28° 00' 36" E.	WWR	250-300	Government	400-1,100, 700
ERITREA					
Assab Radio ..	12° 59' 40" N. 42° 44' 00" E.	ICY	160	Italian Government ..	300, 600
Massaua Radio, ICX	Red Sea 15° 36' 30" N. 39° 28' 59" E.	ICX	1,600	Italian Government ..	2,650, 4,000
Massaua Radio, IRG	Red Sea 15° 36' 30" N. 39° 28' 59" E.	IRG	270	Italian Government ..	300, 600, 1,200
Mersa Fatma ..	14° 14' 00" N. 40° 18' 00" E.	IRT	100	Italian Government ..	600
ESTHONIA					
Narva	59° 23' 00" N. 28° 13' 00" E.	AZN	100	General Direction of Posts and Telegraphs Revel	900
Nekmangrund Light- ship	59° 05' 00" N. 22° 13' 00" E.	AZQ	500	General Direction of Posts and Telegraphs Revel	200, 600, 1,500
Reserve Lightship ..	—	AZX	50	General Direction of Posts and Telegraphs Revel	300, 450, 600
Revalstein Lightship	59° 44' 00" N. 24° 44' 00" E.	AZR	50	General Direction of Posts and Telegraphs Revel	300, 450, 600
Saritchev Lightship..	58° 16' 00" N. 21° 12' 00" E.	AZS	30	General Direction of Posts and Telegraphs Revel	200, 600, 1,500
Tallinn	59° 26' 00" N. 24° 47' 00" E.	AZA	250, 900	General Direction of Posts and Telegraphs Revel	300, 600, 1,200, 600, 1,200, 1,900
Tartu	58° 22' 00" N. 26° 43' 00" E.	AZU	200	—	1,000
FALKLAND ISLANDS					
Port Stanley ..	51° 41' 15" S. 57° 49' 15" W.	VPC	750	Government	600, 900, 1,250, 1,600
Fox Bay	51° 50' 30" S. 60° 02' 40" W.	VQZ	80 100	Government	300, 600
FAROE ISLANDS. (See under DEN- MARK)					

FERNANDO PO. (See under Spain)**FIJI ISLANDS**

Labasa	16° 26' 05" S. 179° 24' 33" E.	VPE	300	Government	300, 600
Savu	Vanua Levu 16° 46' 30" S. 179° 21' 30" E.	VQL	120	Government	600
Suva	Viti Levu 18° 08' 43" S. 178° 27' 35" E.	VPD	300	Government	300, 600
Taveuni	160° 47' 46" S. 179° 59' 44" W.	VPF	200	Government	300, 600

FINLAND (SUOMEN TASAVALTA).

Abo	60° 25' 38" N. 22° 14' 15" E.	OJE	200	Government	1,200
Hangö	59° 50' 18" N. 22° 56' 40" E.	OJD	200	Government	300, 600
Helsingfors	60° 0' 24" N. 25° 03' 07" E.	OJA	500	Government	1,500, 2,000
Kotka	60° 27' 16" N. 26° 57' 04" E.	OJC	200	Government	600, 1,200
Waasa	63° 05' 10" N. 21° 37' 00" E.	OJG	200	Government	600, 1,200
Wiborg	60° 42' 55" N. 28° 45' 00" E.	OJB	200	Government	300, 600

FIUME

Fiume Radio	45° 26' 14" N. 14° 25' 14" E.	IQB	—	Government	600, 2,600, 3,200, 4,100
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FRANCE AND ALGERIA (f)

Abbeville Aerodrome (T.)	To the North of Abbeville 50° 08' 14" N. 01° 50' 31" E.	FNI Abbeville	120, 220	Sous Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	900, 1,400, 1,680 c.w.
Agde D.F.	43° 16' 55" N. 03° 30' 40" E.	FEC	120	—	450, 600, 800
Ajaccio Aerodrome (T.)	41° 54' 59" N. 08° 44' 27" E.	FNJ Ajaccio	60, 100, 200, 350	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	900, 1,400, 1,825
Ajaccio-Aspizetto ..	41° 55' 31" N. 08° 45' 36" E.	FUI	300	—	—
Algiers T.S.F.	To the East of Algiers 36° 45' 00" N. 03° 11' 00" E.	FFA	450	State Telegraphs ..	300, 600
Antibes	43° 35' 00" N. 07° 08' 00" E.	FNK	—	—	900, 1,400, 1,680
Antibes Aerodrome (T.)	43° 35' 03" N. 07° 07' 50" E.	FNK Antibes	400, 120	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	900, 1,400, 1,825
Aubagne	43° 16' 30" N. 5° 36' 00" E.	FUG	150	Navy	—
Bayonne Aerodrome (T.)	To the North-West of Bayonne 43° 30' 19" N. 01° 29' 45" W.	FNY	80	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,525
Bayonne	43° 35' 00" N. 01° 30' 00" W.	FNY	—	—	1,200
Bernières D.F.	49° 20' 00" N. 00° 25' 00" W.	FEB	120	State Telegraphs ..	450, 600, 800
Berre-Bouches-du-Rhône ..	43° 28' 55" N. 05° 10' 45" E.	FED	—	Navy	—
Bonifacio T.S.F.	Strait of Bonifacio 41° 23' 15" N. 09° 12' 00" E.	FFC	350	Postal, Telegraph and Telephone Administration	300, 600
Bordeaux Aerodrome	To the West of Merignac 44° 50' 41" N. 00° 42' 43" W.	FNX	120	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,525

**FRANCE AND
ALGERIA—contd.**

Bordeaux Lafayette T.S.F.	Croix d'Hins, near Bordeaux	LY	—	Administration of Posts, Telegraphs and Telephones	18,940, 23,450
Bordeaux T.S.F.	Near Bordeaux 44° 52' 21" N. 00° 37' 12" W.	FFX	250	Postal, Telegraph and Telephone Administration	300, 600
Boulogne-sur-Mer., T.S.F.	50° 43' 00" N. 01° 37' 00" E.	FFB	250	Postal, Telegraph and Telephone Administration	300, 600
Cherbourg D.F.	49° 36' 32" N. 01° 36' 00" W.	FUC	200	State Telegraphs	450, 600, 800
Cherbourg-Rouges-Terres	49° 36' 32" N. 01° 36' 00" W.	FUC	300, 400	Navy	300, 450, 600, 800, spk. 2,250-2,400 c.w. 450, 600
Cuers-Pierrefeu	43° 14' 40" N. 06° 06' 50" E.	FUO	150	—	—
Dieppe (see note f)	49° 55' 30" N. 01° 04' 30" W.	FFI	150	State Railway Administration	400
Dijon Aerodrome	To the South-East of Longvic 47° 16' 06.5" N. 05° 05' 18.5" E.	FND	120, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,350, 1,400
Djидjelli D.F.	36° 49' 10" N. 05° 46' 12" E.	FEJ	200	Navy	450, 600, 800
Dunkerque-Castelnau	51° 00' 30" N. 02° 23' 15" E.	FUD	800	Navy	450, 600, 800 c.w. 1,350 spark 3,300 arc.
Eiffel Tower (Paris) (T)	48° 51' 30" N. 02° 17' 44" E.	PL	—	War Ministry	2,600, 10,000, 3,000, 7,300, 5,000, 7,000 spk. & cw. 900, 1,400
French Aerodromes (General Call)	—	FNZ	—	—	—
Guipavas D.F.	48° 27' 00" N. 04° 26' 00" E.	FEG	—	Navy	450, 600, 800
Havre T.S.F.	49° 31' 30" N. 00° 07' 00" E.	FFH	250	Postal Telegraph and Telephone Administration	300, 600
Hourtin	45° 13' 08" N. 01° 07' 10" W.	FUH	—	Navy	—
Le Bourget Aerodrome (1)	To the North-East of Le Bourget 48° 57' 23.5" N. 02° 26' 36.5" E.	FNB	220, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,425, 1,680
Le Bourget Aerodrome (T.) (2)	To the North of Louvres 49° 02' 50.5" N. 02° 30' 20.5" E.	FNB Le Bourget	450, 250	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	900
Levallois-Perret T.	—	SFR	—	—	450, 1,780
Lorient D.F.	47° 44' 00" N. 03° 21' 00" W.	FUN	300	Navy	450, 600, 800
Lorient-Pen-Mané	47° 44' 00" N. 03° 21' 00" W.	FUN	300, 400	Navy	300, 450, 600, 800 sp. & c.w.
Lyon Aerodrome	To the South-East of Bron 45° 43' 48.5" N. 04° 56' 24" E.	FNL	120	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,350, 1,400
Lyons	43° 25' 00" N. 05° 13' 00" E.	FNM	—	—	1,680
Lyon T.S.F. (T)	La Doua, near Lyons	YN	—	Administration of Posts, Telegraphs and Telephones	450, 10,000, 15,400 arc, spark, alternator
Marignane Aerodrome	East side of Etang de Berre 43° 26' 32" N. 05° 12' 35" E.	FNM	100, 400	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,525
Marignane	43° 25' 00" N. 05° 13' 00" E.	FNM	—	—	1,680
Marseille T.S.F.	43° 19' 00" N. 05° 2' 00" E.	PFM	250	Government	300, 600
Mengam	Near Brest 48° 20' 52" N. 04° 35' 20" W.	FUE	800	Navy	600, 800, 2,100, 2,400 sp. & c.w.
Mitre D.F. (La)	Near Toulon 43° 06' 11.4" N. 05° 55' 53" E.	FEM	—	Navy	450, 600, 800

FRANCE AND
ALGERIA—*contd.*

Montellmar Aerodrome	To the East of Ancône	FNQ	100	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,825
	44° 34' 54" N.				
	04° 44' 00" E.				
Montelimar	44° 32' 00" N.	FNQ	—	—	1,680
	04° 48' 00" E.				
Moulin du Seigneur D.F.	Near Brest	FEI	—	Navy	450, 600, 800
	48° 19' 36" N.				
	04° 33' 14" W.				
Nancy Aerodrome ..	To the West-South-West of Vandœuvre	FNC	120	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,550
	48° 39' 05" N.				
	06° 09' 06" E.				
Nancy	48° 38' 00" N.	FNC	—	—	1,400, 1,450
	06° 09' 00" E.				
Nantes-Basse-Lande	47° 10' 40" N.	UA	1,500	Navy	2,800, 9,000
	01° 42' 00" W.				
Nice T.S.F.	To the West of Nice	FFN	200	Postal, Telegraph and Telephone Administration	300, 600
	43° 39' 00" N.				
	07° 10' 00" E.				
Nîmes Aerodrome ..	To the North-East of Nîmes	FNN	100	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,825
	43° 51' 29" N.				
	04° 24' 25 5" E.				
Nîmes	43° 52' 00" N.	FNN	—	—	1,680
	04° 25' 00" E.				
Oran-Ain-el-Turck ..	To the West of Oran	FUK	600	Navy	300, 450, 600, 800
	35° 45' 00" N.				
	00° 45' 30" W.				
Oran Aerodrome (T.)	To the South-East of Oran	FOO Oran	250, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	600, 900, 1,400 c.w.
	35° 38' 06 5" N.				
	00° 36' 29" W.				
Penmarch D.F. ..	Finistère	FEP	120	Navy	450, 600, 800
	47° 48' 30" N.				
	04° 21' 01" W.				
Perpignan Aerodrome	To the North-West of Perpignan	FNP	100	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,525
	42° 44' 31 5" N.				
	02° 52' 13" E.				
Perpignan	42° 42' 00" N.	FNP	—	—	1,300
	02° 53' 00" E.				
Pointe Du-Raz D.F.	48° 02' 23" N.	FER	120	Navy	450, 600, 800
	04° 44' 00" W.				
Porquerolles ..	Hyeres Islands	FUQ	600	Navy	450, 600, 800 sp. & c.w.
	42° 59' 00" N.				
	06° 12' 00" E.				
Rochefort	Soubise	FES	150	—	450, 800
	45° 46' 00" N.				
	01° 00' 00" W.				
Rochefort-sur-Mer ..	45° 55' 30" N.	FUR	400	Navy	300, 450, 600, 800 sp. & c.w.
(see no e f)	00° 57' 00" W.				
Romilly Aerodrome	To the South-East of Romilly-sur-Seine	FNR	120	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,680 c.w.
	48° 30' 15 5" N.				
	03° 44' 56" E.				
Romilly Sur Seine ..	48° 31' 00" N.	FNR	—	—	1,400
	03° 44' 00" E.				
Rouen Port	49° 26' 29" N.	HYA	50	Chambre de Commerce de Rouen	Transmitting 720 Listen ng 600
	01° 15' 16" E.				
Sainte Assise ..	25 miles from Paris	UFP UFQ UFR UFT UFU UFZ FUS	—	—	2,300, 9,250, 9750, 14,500, 20,600
Stax	Tunisia		—	—	450
	34° 45' 06" N.				
	10° 46' 24" E.				
Soubise D.F.... ..	45° 56' 21" N.	FES	120	Navy	450, 600, 800
	00° 59' 13" W.				
S. Maries de la Mer T.S.F.	Gulf of Lyons	FFS	450	Postal, Telegraph and Telephone Administration	300, 600
	43° 27' 00" N.				
	01° 26' 00" E.				

**FRANCE AND
ALGERIA—contd.**

S. Nazaïre D.F. ..	Ville es Martin 47° 15' 24" N. 02° 13' 49" W.	FEZ	120	Navy	450, 600, 800
S. Pierre des Corps ..	47° 23' 50" N. 00° 44' 02" E.	YG	—	War Ministry ..	6,000
S. Raphaël	43° 25' 15" N. 06° 44' 07" E.	FUF	150	Navy	—
S. Inglevert Aero- drome (T.)	To the North of S. Inglevert 50° 52' 48" N. 01° 44' 30" E.	FNG Saint Inglevert	450, 250	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	600, 900, 1,400, 1,680
St. Inglevert ..	Near Calais 50° 53' 00" N. 01° 44' 00" E.	FNG	—	—	900, 1,400, 1,680
Strasbourg Aerodrome	To the North-North-West of Entzheim 48° 32' 37" N. 07° 30' 34" E.	FNS	120, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,720
Strasbourg	48° 33' 00" N. 07° 47' 00" E.	FNS	—	—	1,400, 1,720, 2,500
Toulon	La Mitre 43° 05' 11" N. 05° 55' 37" E.	FEM	300	—	600, 800
Toulouse Aerodrome	To the South- West of Toulouse 43° 32' 44" N. 01° 22' 29" E.	FNT	100, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,525
Toulon-Mourillon ..	42° 07' 00" N. 05° 55' 00" E.	FUT	800, 1,200	Navy	1,350, 5,000 sp. & c.w.
Tréguier-St.-Gonery D.F.	S. Gonery 48° 50' 13" N. 03° 13' 56" W.	FET	120	State Telegraphs ..	450, 600, 800
Trinité D.F. (La) ..	Near Brest 48° 21' 53" N. 04° 35' 18" W.	FEX	—	Navy	2,100
Ushant D.F. ..	48° 26' 31" N. 05° 05' 37" W.	FEO	—	Navy	450, 600, 800
Ushant T.S.F. ..	Ushant Island 48° 27' 05" N. 05° 05' 00" W.	FFU	450	Government	300, 600
Valenciennes Aero- drome	To the South of Valenciennes 50° 20' 35" N. 03° 31' 23" E.	FNV	120, 450	Sous-Secrétariat d'Etat de l'Aéronautique et des Transports Aériens	1,400, 1,680

**FRENCH
EQUATORIAL
AFRICA****FRENCH CONGO**

Pointe-Noire ..	Congo, Pointe Noire 04° 46' 49" S. 11° 43' 02" E.	HZL	Day 275 Night 550	Government	300, 600, 1,800
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FRENCH GUIANA

Cayenne	04° 56' 30" N. 52° 19' 30" W.	HYW	500	Government	600, 1,500
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**FRENCH INDO-
CHINA**

Cac-Ba D.F. ..	20° 44' 00" N. 107° 02' 05" E.	HVC	80	Government	300, 600
Fort Bayard ..	21° 13' 00" N. 110° 23' 00" E.	HVH	250	Government	1,800, 2,400
Hanoi	21° 03' 49" N. 105° 54' 18" E.	HVA	1,000	Government	300, 600, 1,800, 2,400, 3,000
Kien-An D.F. ..	Near Haiphong 20° 47' 00" N. 106° 37' 00" E.	HVB	150	—	600, 1,800

FRENCH INDO-CHINA—contd.

Moncay	21° 31' 00" N. 107° 58' 00" E.	HVD	150	Government	600, 1,800
My-Tho	10° 21' 45" N. 10° 21' 45" E.	HVM	250	Government	600, 2,000
Phu-Quoc	10° 18' 00" N. 103° 58' 00" E.	HVP	200	Government	600, 2,000
Poulo-Condore ..	08° 40' 00" N. 106° 41' 00" E.	HVO	100	Government	600, 2,000
Tourane	Touran Bay, Observatory Islet 16° 04' 05" N. 108° 13' 05" E.	HVI	250	Government	300, 600, 1,800

FRENCH SETTLEMENTS IN OCEANIA

Makatea	15° 50' 00" S. 148° 11' 00" W.	HVY	Day 400 Night 600	Government	300, 600
Papeete Ile Tahiti ..	17° 30' 15" S. 149° 29' 15" W.	HVN	Day 600, 1,000 Night 1,500, 2,000	Government	600, 2,000, 2,500

FRENCH SOMALI COAST

Djibouti	11° 35' 15" N. 43° 07' 20" E.	HYA	350	Administration of the Colony	600
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FRENCH WEST AFRICA and THE SAHARA

Conakry	Guinea 09° 30' 59" N. 13° 42' 46" W.	HWD	400	Government	300, 600, 2,000
Cotonou	Dahomey 06° 20' 46" N. 02° 28' 48" E.	HWH	300	—	300, 600
Dakar	Senegal 14° 40' 27" N. 17° 25' 22" W.	HWB	600	Government	300, 600
Grand-Bassam ..	Ivory Coast 05° 11' 00" N. 03° 43' 00" W.	HWG	300	Government	600
Port Etienne ..	Mauretania, Bay of Levrier 20° 55' 39" N. 17° 03' 01" W.	HWI	400	Government	300, 600, 2,000
Rufisque	Senegal 14° 43' 04" N. 17° 16' 23" W.	HWC	500	Government	300, 600, 2,000
Tabou	Ivory Coast 04° 25' 19" N. 07° 22' 27" W.	HWF	400	Government	600

FRIENDLY ISLANDS
(See under **PACIFIC ISLANDS**)**GAMBIA**

Bathurst (T.) ..	13° 27' 16" N. 16° 34' 19" W.	VSH	180	Government (British)	300, 450, 600, 600, 850
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GERMANY
(see also G)

Adlergrund Lightship	Baltic Sea 54° 50' 12" N. 14° 22' 06" E.	KAG	Day 100 Night 150	Reichspostministerium, Berlin, W.66	300, 600
Amrum Bank Lightship	North Sea 54° 33' 12" N. 07° 53' 12" E.	KAF	Day 120 —	Reichspostministerium, Berlin, W.66	800, 450, 600
Amragst Lighthouse	Jade Bay 53° 28' 58" N. 08° 11' 06" E.	KAT	Night 210	Reichspostministerium, Berlin, W.66	450

GERMANY—contd.

Aussenjade Lightship	North Sea 53° 51' 34" N. 07° 56' 40" E.	KAU	60	Reichspostministerium, Berlin, W.66	300, 450
Berlin	—	DL	—	—	2,000
Borkum, D.F.	53° 34' 51" N. 06° 41' 42" E.	KBO	300	Reichspostministerium, Berlin, W.66	1,250
Borkum Lightship	North Sea 53° 35' 48" N. 06° 40' 12" E.	KBM	—	Reichspostministerium, Berlin, W.66	450, 600
Borkum Riff Light- ship	North Sea 53° 45' 05" N. 06° 04' 05" E.	KBR	Day 90 Night 120	Reichspostministerium, Berlin, W.66	300, 600
Bremerhaven Lloyd- halle	North Sea Coast 53° 33' 04" N. 08° 33' 08" E.	KBH	80	Norddeutscher Lloyd	300
Cologne	—	GEK	—	—	900, 1,680
Cuxhaven	North Sea Coast 53° 52' 24" N. 08° 42' 43" E.	KBX	Day 325 Night 650	Reichspostministerium, Berlin, W.66	300, 600 (spark)
Cuxhaven	53° 52' 00" N. 08° 43' 00" E.	KCX	—	—	600 spark
Eberswalde (T)	—	—	—	—	2,930
Eider Lightship	North Sea 54° 11' 00" N. 08° 18' 18" E.	KAJ	Day 30 Night 50	Reichspostministerium, Berlin, W.66	300, 600
Eiderlotsengaliote Lightship	North Sea 54° 13' 46" N. 08° 35' 3" E.	KBL	Day 90 Night 160	Government	800, 450, 600
Eilvese	Near Hanover 52° 32' 00" N. 09° 25' 00" E.	OUI	5,400	—	9,700, 14,600 c.w. Alt.
Elbe Lightship	North Sea 54° 00' 03" N. 08° 15' 00" E.	KBF	60	Reichspostministerium, Berlin, W.66	600
Fehmarnbelt Light- ship	Baltic Sea 54° 36' 02" N. 11° 00' 23" E.	KBC	Day 100 Night 180	Reichspostministerium, Berlin, W.66	300, 450, 600
Heligoland	North Sea 54° 11' 01" N. 07° 53' 00" E.	KAH	100	Reichspostministerium, Berlin, W.66	300, 600
Kalkgrund Lightship	54° 49' 54" N. 09° 53' 18" E.	KBD	Day 90 Night 160	Reichspostministerium, Berlin, W.66	300, 450, 600
Kiel Lightship	Baltic Sea 54° 29' 00" N. 10° 16' 15" E.	KBI	Day 40 Night 70	Reichspostministerium, Berlin, W.66	300, 450, 600
Kiel-Friedrichsort	Kiel Bay 54° 23' 38" N. 10° 11' 26" E.	KBK	220	—	300, 450, 600
Konigs Wusterhausen	Near Berlin 52° 18' 19" N. 13° 37' 22" E.	LP	1,100	—	2,800, 3,300, 5,250, 5,700, 7,200 c.w. valve & Arc.
List D.F.	Sylt 55° 00' 12" N. 08° 23' 12" E.	KAO	—	Reichspostministerium, Berlin, W.66	450, 600, 800
List Lightship	Sylt 55° 01' 20" N. 08° 26' 30" E.	KAL	—	Reichspostministerium, Berlin, W.66	600
Nauen	Near Berlin 52° 39' 00" N. 12° 55' 00" E.	POZ	6,500	—	3,100, spk. 4,900, 5,600, 6,300, 8,700, 9,800, 13,000 18,050 c.w. Alt.
Norddeich (T.)	North Sea Coast 53° 36' 26" N. 07° 08' 32" E.	KAV	Day 420 Night 830	Reichspostministerium, Berlin, W.66	300, 600, 2,050, sp. 2,150 2,250 c.w.
Norderney Lightship	53° 55' 39" N. 7° 13' 50" E.	KAI	Day 75 Night 100	Government	300, 450, 600
Nordholz D.F.	North Sea Coast 53° 47' 06" N. 08° 38' 27" E.	KBQ	300	Reichspostministerium, Berlin, W.66	450, 600, 800
Nordholz Lightship	North Sea Coast 53° 47' 00" N. 08° 38' 00" E.	KBN	—	Reichspostministerium, Berlin, W.66	600
Pillau Lightship	Baltic Sea Coast 54° 38' 42" N. 19° 53' 27" E.	KAP	—	Reichspostministerium, Berlin, W.66	60

GERMANY—contd.

Riehl	50° 58' 00" N. 06° 58' 00" E.	GGC	500	British Government ..	1,900
Sassnitz (see note g)	Island of Rugen 54° 30' 50" N. 13° 38' 35" E.	KBV	110	Reichspostministerium, Berlin, W.66	375
Stolpmunde, L.S. and D.F.	54° 34' 40" N. 16° 50' 06" E.	KAY	—	Reichspostministerium, Berlin, W.66	—
Stralsund Lightship	54° 18' 42" N. 13° 06' 06" E.	KBU	—	—	—
Swinemunde	Usedom Island 53° 54' 55" N. 14° 16' 15" E.	KAW	Day 330 Night 660	Reichspostministerium, Berlin, W.66	300 600
Warnemunde D.F.	Baltic Sea Coast 54° 10' 39" N. 12° 00' 56" E.	KBY	—	Reichspostministerium, Berlin, W.66	—
Warnemunde Lightship	Baltic Sea Coast 54° 10' 59" N. 12° 03' 04" E.	KBE	—	Reichspostministerium, Berlin, W.66	—
Weser Lightship ..	North Sea 53° 54' 18" N. 07° 49' 30" E.	KBW	80	Reichspostministerium, Berlin, W.66	300
Wilhelmshaven Light- ship 3rd Entrance D.F.	53° 31' 16" N. 08° 09' 33" E.	KAN	—	Reichspostministerium, Berlin, W.66	600 800 spl.

GIBRALTAR

Gibraltar, North Front	36° 08' 32" N. 05° 20' 29" W.	BWW	—	British Admiralty ..	—
Gibraltar Rock ..	36° 06' 21" N. 05° 20' 54" W.	BYW	500	British Admiralty ..	600, 2,400, 2,800 c.w.

**GILBERT and
ELLICE ISLANDS**
(See under **PACIFIC
ISLANDS**)**GOLD COAST**

Accra	05° 32' 23.94" N. 40° 12' 13.74" W.	VPG	250	Government	300, 600
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GREAT BRITAIN.
including **IRELAND**
(see note h)

Aberdeen	Aberdeenshire, Scotland 57° 11' 29.9" N. 02° 11' 13" W.	BYD	—	Admiralty	—
Aberdeen 2 BD ..	—	2 BD	—	British Broadcasting Company	495
Admiralty	London 51° 30' 00" N. 00° 10' 00" W.	BYA	—	Admiralty	—
Air Ministry	London 51° 27' 50" N. 00° 01' 35" E.	GFA	500, 1,200	British Air Force ..	900, 1,400, 1,680 4,100 c.w.
Aldershot	51° 15' 55" N. 00° 45' 25" W.	GGB	1,000	—	1,900 c.w.
Andover	Hants 51° 12' 30" N. 01° 32' 30" W.	GFI	—	British Air Force	—
Ballycastle Radio ..	Antrim, North Channel 55° 11' 00" N. 06° 12' 00" W.	GSL	15	Post Office	250
Bar Lightship	53° 32' 05" N. 03° 17' 40" W.	GKD	—	—	500
Berwick D.F.	Berwickshire 55° 41' 46.7" N. 01° 53' 41.7" W.	BVG	—	Admiralty	450
Bircham Newton ..	52° 52' 30" N. 00° 39' 45" E.	GFN	—	British Air Force ..	c.w.
Birmingham 5 IT ..	—	5 IT	—	British Broadcasting Company	475
Bournemouth 6 BM	—	6 BM	—	British Broadcasting Company	385

GREAT BRITAIN including IRELAND —con'd.					
Calster-on-Sea Radio	Near Yarmouth 52° 38' 47" N. 01° 43' 51" E.	GCS	—	Post Office	7,000 1,550
Calshot	Southampton Water 50° 49' 10" N. 01° 18' 30" W.	GFL	—	British Air Force ..	—
Cardiff, 5 WA	—	5 WA	—	British Broadcasting Company	353
Carnarvon Radio ..	Ceunant 53° 07' 00" N. 04° 11' 00" W.	MUU	—	Marconi Company ..	14,200 c.w.
Castle Bromwich Radio (T)	Near Birmingham 52° 31' 00" N. 01° 47' 40" W.	GEC Castle Bromwich	400 Mrse. 100 Tpnny.	British Air Force ..	900, 1,300 c.w. 900
Cattewater ..	Devon 50° 20' 45" N. 04° 07' 00" W.	GFM	—	British Air Force ..	—
Chatham, Admiralty House	—	BXC	50	Admiralty	310
Chatham, H.M.S. Hecla	—	BXM	250	Admiralty	310
Chelmsford	51° 43' 45" N. 00° 28' 38" E.	MZX	—	Marconi Company ..	3,800
Cleethorpes Radio ..	South East of Grimsby 53° 31' 44.4" N. 00° 03' 17.6" W.	BYB	1,000	—	3,000 spk. 3,000—8,000, 4,200, 4,500 c.w.
Clifden Radio ² ..	53° 27' 00" N. 10° 01' 00" W.	MFT	2,000	Post Office	5,780 spark 5,780 c.w.
Corkbeg ²	Entrance to the Port of Cork 51° 48' 56.1" N. 08° 15' 20" W.	BYQ	—	Admiralty	600, 800
Cranwell	Lincolnshire 53° 02' 05" N. 00° 29' 50" W.	GFC	—	British Air Force ..	—
Crookhaven	South Coast of Ireland 51° 27' 00" N. 09° 46' 00" W.	GXO	250	Post Office	300
Cross Sand Lightship	North-East of Yarmouth 52° 38' 00" N. 01° 54' 00" E.	GVA	15	Trinity House ..	230
Croydon, D.F. ..	Near London 51° 21' 10" N. 00° 07' 40" W.	GED Croydon	400 Mrse. 150 Tpnny.	British Air Force ..	900, c.w. 900
Croydon Radio (T) ..	Near London 51° 21' 10" N. 00° 07' 40" W.	GED Croydon	400 Mrse. 150 Tpnny.	Civil Aviation ..	900, c.w. 900
Cullercoats Radio ..	Near Tynemouth 55° 02' 15.6" N. 01° 25' 41.5" W.	GCC	250	Post Office	300, 600
Culver Cliff	Isle of Wight 50° 39' 58.4" N. 01° 06' 07.8" W.	BYM	200	Admiralty	—
Devizes Radio ..	51° 23' 49.7" N. 01° 57' 10.7" W.	GKU	1,000	Post Office	1,800, 2,100 2,500, 3,000 c.w.
Didsbury Radio (T)	Manchester 53° 26' 15" N. 02° 15' 30" W.	GEM Didsbury	400 Mrse. 100 Tpnny.	British Air Force ..	900, 1,300, c.w. 900
Dolphin, Fort Block- house	Portsmouth 50° 47' 00" N. 01° 07' 00" W.	BXO	—	Navy	—
Donibristle	56° 02' 35" N. 03° 21' 05" W.	GFK	250	—	1,300 c.w.
Duxford	Cambridge 52° 05' 40" N. 00° 07' 45" E.	GFH	—	British Air Force ..	—
East Goodwin Light- ship	Straits of Dover 51° 13' 00" N. 01° 36' 00" E.	GVB	15	Trinity House	230
Farnborough ..	Hampshire 51° 16' 55" N. 00° 45' 05" W.	GFQ	—	British Air Force ..	—

GREAT BRITAIN including IRELAND — <i>old</i> .					
Fastnet	Fastnet Rock	GNJ	100	Society of Lloyd's	300
Fishguard Radio	Pembrokeshire 52° 00' 44 5" N. 04° 59' 19 5" W.	GRL	100	Post Office	300, 600,
Flamborough D.F.	Yorkshire 54° 06' 49 7" N. 00° 04' 56 3" W.	BVN	—	Admiralty	450
Flowerdown	Hampshire 51° 05' 15" N. 01° 20' 00" W.	GFR	—	British Air Force	—
Folkestone Harbour Radio	Straits of Dover 51° 04' 38" N. 01° 11' 27" E.	GUR	45	South Eastern and Chatham Railway	300, 600
GEZ	—	GEZ	—	British Air Force	—
Glasgow 5 SC	—	5 SC	—	British Broadcasting Company.	420
Gosport	Near Portsmouth, Hants 50° 48' 00" N. 01° 09' 40" W.	GFP	—	British Air Force	—
Grimsby Radio	53° 35' 07" N. 00° 04' 05 7" W.	GKZ	100	Navy	300, 600
Guernsey (T)	Channel Islands, St. Peter's Port 49° 26' 40" N. 02° 32' 15" W.	GEY Guernsey	400 Mrse. 100 Tpnny.	British Air Force	900, 1,300, c.w. 900
Gull Lightship	Straits of Dover 51° 16' 00" N. 01° 28' 00" E.	GVC	15	Trinity House	230
Henlow	Bedfordshire 52° 00' 40" N. 00° 18' 00" W.	GFY	—	British Air Force	—
Heysham Harbour Radio	Irish Sea Morecambe Bay 54° 02' 00" N. 02° 55' 00" W.	GKG	150	Midland Railway	400
Horsea	Near Portsmouth 50° 50' 15" N. 01° 06' 10" W.	BYC	—	Navy	—
Inchkeith D.F.	Firth of Forth 56° 01' 59" N. 3° 08' 04" W.	BZA	—		(Experimental)
Ipswich	Suffolk 52° 03' 18 8 N. 01° 08' 28 2" E.	BYE	—	Admiralty	—
Isle of Grain	Kent 51° 27' 10" N. 00° 43' 15" E.	GFG	—	British Air Force	c.w.
Isle of Man Radio	54° 09' 00" N. 04° 30' 00" W.	GDX	—	Post Office	—
Kingstown	53° 17' 49" N. 06° 08' 20" W.	BWK	—	Admiralty	—
Land's End Radio	West Coast of Cornwall 50° 07' 03 8" N. 05° 40' 10" W.	GLD	250	Post Office	300, 600
Lee-on-the-Solent	Hampshire 50° 48' 25" N. 01° 12' 25" W.	GFW	—	British Air Force	c.w.
Lerwick Radio	Shetland Isles 60° 08' 25" N. 01° 11' 00" W.	GEL	250		600, 900, 1,400
Leuchars	Fifeshire 56° 22' 40" N. 02° 52' 15" W.	GFD	—	British Air Force	c.w.
Lizard D.F.	49° 59' 06 3" N. 05° 12' 24 1" W.	BVY	—	Admiralty	450
Loch Boisdale Radio	Hebrides 57° 08' 00" N. 07° 16' 00" W.	GCB	150	Post Office	300
London, 2 LO	—	2 LO	—	British Broadcasting Company	365

GREAT BRITAIN
including IRELAND
—cont.

Lympe Radio (T) ..	Kent, near Folkestone 51° 04' 40" N. 01° 00' 50" E.	GEG Lympe	400 Morse 100 Tpny.	British Air Force ..	.90, c.w. 900
Malin Head Radio ..	Northern Ireland 55° 21' 45" N. 07° 20' 30" W.	GMH	250	Post Office	300, 600
Manchester 2 ZY ..	—	2 ZY	—	British Broadcasting Company	375
Manchester	53° 26' 00" N. 02° 15' 00" W.	GEM	—	Air Ministry ..	900, 1,300
Netheravon	Wiltshire 51° 14' 40" N. 01° 45' 45" W.	GFX	—	British Air Force ..	c.w.
Newcastle 2 NO ..	—	2 NO	—	British Broadcasting Company	400
Newhaven Radio ..	50° 47' 09" N. 00° 03' 30" E.	GNV	120	London, Brighton and South Coast Railway	400
Niton Radio ..	Isle of Wight 50° 35' 41" N. 01° 17' 00" W.	GNI	150	Post Office	300, 600
North Foreland Radio	North of Rams- Ramsgate 51° 22' 29" N. 01° 26' 51" E.	GNF	150	Post Office	300, 600
Northolt Radio ..	Near London 51° 33' 05" N. 00° 21' 30" W.	GKB	—	Post Office	6,890 c.w.
Old Sarum	Wiltshire 51° 06' 00" N. 01° 47' 10" W.	GFT	—	British Air Force ..	c.w.
Ongar Radio ..	5° 42' 51" N. 00° 11' 18" E.	GLA GLB GLO GLP BXH	—	Marconi Company ..	2,900, 3,950, 4,350 5,100
Orfordness, D.F. ..	Suffolk 52° 05' 46" N. 01° 32' 56" E.	—	—	—	450
Oxford Radio (Leafield) ..	51° 49' 57.5" N. 01° 32' 47" W.	GBL	2,500	Post Office	8,750, 9,200, 12,500, 13,000, 15,500
Parkeston Quay Radio	Near Harwich 51° 56' 58" N. 01° 15' 12" E.	GPQ	130	Great Eastern Railway	450, 600
Pembroke	Pembrokeshire Wales 51° 41' 30" N. 04° 57' 31.7" W.	BYF	—	Admiralty	—
Poldhu Radio ..	Extreme South- West of England 50° 01' 44" N. 05° 15' 43.4" W.	MPD	1,500	Marconi Company ..	2,700 c.w.
Portland Bill ..	English Channel 50° 31' 13.8" N. 02° 27' 17.6" W.	BYN	—	Admiralty	600, 800
Portpatrick Radio ..	Scotland, North Channel 54° 50' 37.7" N. 05° 07' 23.8" W.	GPK	150	Post Office	300, 600
Portsmouth Signal School ..	Hampshire 50° 48' 00" N. 01° 06' 00" W.	BZC	—	Admiralty	—
Pulham, D.F. (T)	Norfolk 52° 24' 15" N. 01° 14' 23" E.	GEP Pulham	400 Morse 100 Tpny.	British Air Force ..	900, c.w. 900
Pulham Radio (T)	Norfolk 52° 24' 15" N. 01° 14' 25" E.	GEP Pulham	400 Morse 100 Tpny.	British Air Force ..	900, c.w. 900
Rame Head	Entrance to the Port of Plymouth 50° 18' 59.3" N. 04° 13' 0.9" W.	BYO	—	Admiralty	600, 800
Rathlin Island Radio	North Channel 55° 17' 00" N. 06° 10' 00" W.	GRN	15	Post Office	250

GREAT BRITAIN

including IRELAND

—con d.

Renfrew Radio (T) ..	Near Glasgow 55° 51' 55" N. 04° 23' 40" W.	GER Renfrew	400 Morse 100 Tpnny.	British Air Force ..	900, 1,300, c.w. 900
Rosyth	West of Edinburgh 56° 01' 42" N. 03° 24' 43.9" W.	BYH	—	Admiralty	—
Sanday	Orkney Islands 59° 14' 14" N. 2° 36' 12" W.	GKJ	20	—	250
Seaforth Radio ..	Liverpool 53° 28' 06.7" N. 03° 00' 42" W.	GLV	150	Post Office	300, 600
Sheerness	Mouth of the Thames 51° 26' 45" N. 00° 44' 46" E.	BYK	—	Admiralty	—
Shotwick	Cheshire 53° 13' 25" N. 02° 59' 55" W.	GPO	—	British Air Force ..	—
South Goodwin Light- ship	Straits of Dover 51° 09' 00" N. 01° 28' 00" E.	GVD	15	Trinity House	230
Spittlegate	Lincolnshire 52° 54' 00" N. 00° 36' 30" W.	GFS	—	British Air Force ..	—
Stonehaven Radio ..	South of Aberdeen 56° 56' 21.8" N. 02° 16' 49.2" W.	GSW	900, 250	Post Office	300, 600, 1,800, 3,000, 4,600, 5,000
Sunk Lightship ..	South-East of Harwich 51° 51' 00" N. 01° 30' 00" E.	GVE	30	Trinity House	230
Tobermory Radio ?..	Isle of Mull 56° 37' 10" N. 06° 03' 30" W.	GCA	150	Post Office	300
Tongue Lightship ..	North of Margate 51° 30' 00" N. 01° 23' 00" E.	GVF	15	Trinity House	230
Uxbridge	Middlesex 51° 32' 45" N. 00° 27' 35" W.	GFU	—	British Air Force ..	c.w.
Valentia Radio ..	51° 55' 51" N. 10° 20' 53.6" W.	GCK	250	Post Office	300, 600
Wick Radio	North Coast of Scotland 58° 26' 16" N. 03° 05' 53.5" W.	GKR	150	Post Office	300, 600
Writtle	—	2 MT	—	Marconi Scientific Inst. Company	400

GREECE (i)

Alexandroupolis ..	Thrace 40° 49' 52" N. 25° 53' 54" E.	SXD	—	Government	600
(D. deagatch)	37° 58' 30" N. 23° 43' 13" E.	SXA	—	Government	600, 1,200
Athens No. 1 ..	37° 58' 30" N. 23° 43' 13" E.	SXA	150	—	600
Athens No. 2 ..	37° 59' 17" N. 23° 41' 34" E.	SXG	—	—	3,600, 4,400
Athens Botanique No. 1	37° 59' 17" N. 23° 41' 34" E.	SXG	—	—	600, 900, 1,200
Athens Botanique, No. 2	37° 49' 26" N. 23° 48' 40" E.	SXB	200	Government	300, 600
Athens Radio ..	Island of Chios 38° 20' 00" N. 26° 05' 30" E.	SXO	—	Navy	600
Chios	39° 37' 11" N. 19° 54' 21" E.	SXK	—	—	2,000
Corfu No. 1 ..	39° 37' 11" N. 19° 54' 21" E.	SXK	—	—	3,500, 4,500, 5,800
Corfu No. 2 ..	39° 37' 11" N. 19° 54' 21" E.	SXK	200	—	300, 600
Corfu No. 3 ..	19° 54' 21" E.				

GREECE—*contd.*

Fassa	Andros	SXF	—	—	600
	37° 57' 35" N. 24° 42' 35" E.				
Isthmus of Corinth (<i>cc note i</i>)	37° 55' 05" N. 22° 59' 55" E.	SXI	—	Nouvelle Société de l'Isthme de Corinthe	300, 600
Poros	37° 30' 08" N. 23° 27' 40" E.	SXP	—	—	600
Salamis	Island of Salamis 37° 58' 11" N. 23° 32' 02" E.	SXL	—	Government	600
Samos	Island of Samos 37° 47' 00" N. 26° 40' 00" E.	SXM	—	Navy	600
Thessalonika (Salonica)	40° 35' 43" N. 22° 57' 56" E.	SXC	—	—	600

**GUADELOUPE AND
DEPENDENCIES**

Destrellan	16° 15' 11" N. 61° 34' 23" W.	HYU	400	Government	600, 800, 1,200, 1,500
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**GUAM (See under
PACIFIC ISLDS)****HAITI REPUBLIC**

Port au Prince ..	18° 33' 18" N. 72° 19' 52" W	NSC	300, 600	United States Navy ..	600, 975, 2,255, 2,400, 3,825, 3,950
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**HAWAIIAN ISLANDS
(S A N D W I C H
ISLANDS)**

Hilo	19° 44' 03" N. 155° 03' 09" W.	NPH	—	U.S. Navy	507
Hono'ulu-KOG ..	21° 18' 12" N. 157° 0' 36" W.	KOG	200	—	300, 550, 600
Honolulu NPM ..	Island of Oahu 21° 26' 45" N. 157° 58' 00" W.	NPM	300-2,500	U.S. Navy	600, 975, 2,250, spk. 2,400, 2,650, 3,950, 4,800, 7,900, 8,875 c.w. 16,300 c.w.
Kahuku KGI ..	Island of Oahu 21° 42' 12" N. 157° 58' 33" W.	KGI	4,000	Radio Corp. of America	
Kahuku KIE ..	—	KIE	4,000	Radio Corp. of America	9,145, 16,975 spk. & c.w.
Kaunakakai ..	Island of Molokai 21° 05' 21" N. 157° 01' 29" W.	KHO	30	Mutual Telephone Co., Ltd.	300, 550, 600
Kawaihae	Island of Hawaii 20° 02' 38" N. 155° 50' 05" W.	KHN	300	Mutual Telephone Co., Ltd.	300, 550, 600
Lihue	Island of Kauai 21° 57' 58" N. 159° 22' 16" W.	KHM	300	Mutual Telephone Co., Ltd.	300, 550, 600
Luke Field	Fords Island	WYQ	250	U.S. Army	1,500
Pearl Harbor ..	Island of Oahu 21° 20' 45" N. 157° 58' 00" W.	NPM	300-5,000	U.S. Navy	600, 975, 2,255, spk. 9,145, 9,800, 12,000 c.w.
Wahiawa	21° 29' 28" N. 158° 02' 37" W.	KHK	250	Mutual Telephone Co.	300, 550, 600
Wa'alu	Island of Maui 20° 55' 00" N. 156° 30' 00" W.	KHL	200	—	300, 550, 600

**HOLLAND (i)
(NETHERLANDS)**

Amsterdam AD ..	52° 22' 23" N. 04° 53' 02" E.	AD	200	—	1,500, 1,700 C.W.
Amsterdam PA5 (T)	—	PA5	—	Smith & Hooghoudt	1050 T'py.
Amsterdam PCA ..	52° 22' 27" N. 04° 54' 45" E.	PCA	—	Navy	400, 600 1,800, 2,200

HOLLAND—contd.

Amsterdam PCFF (News Office, Vas D 12)	—	PCFF	—	Stock Exchange ..	2,000 c.w.
Flushing	Zealand 51° 26' 52" N. 03° 35' 35" E.	PCD	200	Navy	600
Flushing FCI	—	PCI	—	Government	600
Helder PCB	North Holland 52° 57' 49.5" N. 04° 46' 33" E.	PCB	—	Government	600
Helder PCC	52° 57' 05" N. 04° 46' 23.5" E.	PCC	—	—	600
Hilversum	—	—	—	Ned. Seintoestellen Fabriek	1,050 T'py.
Ijmuiden (T)	—	PCMM	—	—	1,050 T'py.
Kootwijk-Sanbeek	52° 10' 24" N. 05° 49' 30" E.	PCG	5,000- 6,000	Government	6,250, 8,400, 12,500, 16,800 c.w.
Mok (De)	Texel Island 53° 00' 02" N. 04° 45' 56.5" E.	PCE	40	—	400, 600
Noord-Hinder Light- ship	North Sea 51° 35' 30" N. 02° 36' 43" E.	PCN	10	N.T.M. Radio-Holland	400, 600
Rotterdam (T)	51° 53' 00" N. 04° 27' 00" E.	RDM Rotterdam	500	—	900, 1,400
Rotterdam	51° 53' 14" N. 04° 29' 23" E.	RT	325	Government	1,500, 1,560, 1,750, 2,250 c.w.
Scheveningen Port ..	North Sea Coast, near The Hague, 52° 05' 40" N. 04° 15' 30" E.	PCH	250	Government	300, 500, 600, 1,800 Mixed
Schiphol (T)	5° 1' 05" N. 04° 48' 0" E.	SPL Schiphol	—	Army	500
Soesterberg (T)	52° 08' 00" N. 05° 17' 00" E.	STB	—	Army	900, 1,400, 1,680, 1,900 c.w.
Terschellinger Bank Lightship	North Sea 53° 29' 00" N. 04° 02' 00" E.	PCM	40	N.T.M. Radio-Holland	400, 600
The Hague (T)	—	PCGG	—	Radio Industrie ..	1,085 T'py.
The Hague (Hearsen Laboratory) (T)	—	PCUU	—	—	1,050 T'py.
The Hague (Velt- huizen) (T)	—	PKKK	—	—	1,050 T'py.
Vliegkampen	—	PCF	—	General call for aerodromes	—
(see note j)					

HONG-KONG

Cape D'Aguilar ..	22° 13' 00" N. 114° 16' 00" E.	VPS	350	Post Office	300, 600, 1,800
Stonecutters Island..	22° 19' 17.7" N. 114° 08' 40" E.	BXY	—	British Admiralty ..	2,000

HUNGARY

Csepel	47° 28' 29" N. 19° 03' 26" W.	HB	1,070	—	2,800-7,000, 4,400 4,700
(BUDAPEST)					

ICELAND

Flatey á Breidafirdi	65° 22' 30" N. 22° 55' 24" W.	TFB	250	Government	300, 600
Reykjavik Radio ..	64° 08' 55" N. 21° 57' 11" W.	TFA	500	Government	300, 600, 900, 1,800
Vestmannaeyjar Radio	Vestmann Islands 63° 26' 20" N. 20° 16' 10" W.	TFC	200	—	600, 1,450

INDIA. (See under
BRITISH INDIA)**IRAQ** (See under
PERSIAN GULF)**IRELAND.** (See under
GREAT BRITAIN)

ITALIAN SOMALI- LAND						
Bardera	02° 21' 10" N. 42° 16' 15" E.	ISN	—	Government	—	
Brava	Benadir 01° 06' 25" N. 44° 02' 04" E.	ISC	120	Government	300, 600	
Bulo Burti	03° 52' 00" N. 45° 34' 00" E.	ISJ	—	Government	—	
Giumbo	Benadir 00° 14' 51" S. 42° 37' 27" E.	ISD	200	Government	300, 600	
Hafun, Dante Alighieri Radio	10° 34' 00" N. 51° 07' 00" E.	ISP	50	—	600	
Iscia Baidoa	03° 01' 10" N. 43° 39' 31" E.	ISH	—	Government	—	
Itala	Benadir 02° 45' 27" N. 46° 19' 43" E.	ISM	50	Government	300, 600	
Lugh	03° 48' 00" N. 42° 36' 00" E.	ISO	—	Government	—	
Mahaddei Uen	02° 58' 14" N. 45° 31' 01" E.	ISF	—	Government	—	
Merka	Benadir 01° 42' 49" N. 44° 46' 22" E.	ISB	50	Government	300, 600	
Mogadiscio ISE (Mogadishu)	Benadir 02° 02' 13.5" N. 45° 21' 14.5" E.	ISE	160	Government	300, 600	
Mogadiscio ISG (Mogadishu)	Benadir 02° 02' 13.5" N. 45° 21' 14.5" E.	ISG	—	—	2,850	
Obbia	05° 20' 01" N. 48° 31' 55" E.	ISQ	200	—	400, 600	
Oddur	04° 07' 05" N. 43° 45' 00" E.	ISI	—	Government	—	
ITALY						
(<i>ce no'e k</i>)						
Alessandria	—	—	—	Army	—	
Ancona	Coast of the North Adriatic Sea	—	—	Army	—	
Ancona IQW (<i>r</i>)	Coast of the North Adriatic Sea	IQW	—	Army	—	
Aspio Radio	43° 37' 00" N. 13° 31' 50" E. Near Ancona	ICA	270	Government	300, 600	
Bologna	43° 31' 30" N. 13° 31' 25" E.	—	—	Army	—	
Brescia	—	—	—	Army	—	
Brindisi Radio	Coast of the Adriatic Sea Puglie Province of Lecce	ICE	270, 300,	Government	300, 600, spk. 2,400 c.w.	
Cagliari	40° 38' 45" N. 17° 57' 08" E.	—	—	Army	—	
Capo Sperone Radio	Sardinia Island of S. Antioco	ICR	270	Government	300, 600	
Catania	38° 57' 59" N. 08° 24' 42" E.	—	—	Army	—	
Catanzaro	—	—	—	Army	—	
Chieti	—	—	—	Army	—	
Civitavecchia Radio	Coast of the Central Tyrrhenian Sea Province of Rome	IDL	120	—	300, 600	
Coltano	42° 05' 21" N. 11° 47' 25.9" E.	ICC	—	—	10,750 c.w.	
Cotrone Radio	Ionian Sea Coast Province of Catanzaro	IDH	120	—	300, 600	
	39° 04' 50" N. 17° 07' 56" E.					

ITALY—*contd.*

Cuneo	—	—	—	Army	—
Florence	43° 40' 36" N. 11° 10' 25" E.	—	—	Army	—
Genoa	—	—	—	—	—
Genoa Radio	44° 25' 44" N. 8° 56' 02" E.	ICB	270, 500	Government	300, 600, spk. 2,070, 2,400, 2,700 2,900, 3,500, 4,000, 4,500. c.w.
Guglielmo Marconi ..	Coltano, between Pisa and Leghorn 43° 38' 35" N. 10° 24' 06.07" E.	ICI	—	—	—
Lampedusa	Island of the S.W. of Sicily 35° 31' 00" N. 12° 37' 00" E.	ICL	—	—	—
Lipari	Island in the South Tyrrhenian Sea 38° 28' 00" N. 14° 57' 15" E.	IDD	—	—	—
Leghorn (k)	Coast of the North Tyrrhenian Sea 43° 31' 31" N. 10° 18' 32.8" E.	IDK	—	Army	—
Maddalena Radio ..	Straits of Boni- facio Maddalena Island 41° 12' 50" N. 9° 25' 10" E.	ICH	270	Government	300, 600
Messina	Sicily on the Strait of Messina 38° 15' 00" N. 15° 37' 27" E.	IFM	—	Government (State Railways)	—
Messina Radio (see note k)	Sicily on the Strait of Messina 38° 15' 30" N. 15° 37' 50" E.	ICF	120, 300	Government	300, 600
Milan	—	—	—	Army	—
Murano D.F.	North Adriatic Sea 45° 27' 40" N. 12° 21' 22" E.	IRM	—	Government	300, 600
Naples Radio	40° 50' 34" N. 14° 14' 42" E.	ICN	270, 300	Government	300, 600, spk. 2,400 c.w.
Novara	—	—	—	Army	—
Padua	—	—	—	Army	—
Palermo Radio	North Coast of Sicily 38° 11' 50" N. 13° 16' 00" E.	ICP	270	Government	300, 600
Pantelleria	Island to the S.W. of Sicily 36° 49' 00" N. 11° 57' 25" E.	ICG	—	—	—
Perugia	—	—	—	Army	—
Piacenza	—	—	—	Army	—
Pola	North Adriatic Sea, Istria 44° 51' 10" N. 13° 50' 50" E.	IQZ	300	Army	300, 600
Potenza	—	—	—	Army	—
Ravenna	—	—	—	Army	—
Reggio Calabria ..	Strait of Messina 38° 08' 00" N. 15° 38' 30" E.	IFR	—	Government	—
Rome	—	—	—	Army	—
Rome Centocelle ..	41° 52' 10" N. 12° 33' 06" E.	ICD	—	Army	2,250 10,850 Arc
Rome San Paolo ² ..	Rome (k) — 41° 52' 00" N. 12° 31' 00" E.	IDO	—	—	—

ITALY—contd.

Salerno	—	—	—	Army	—
Smyrna	Warship in Harbour	IQL	—	—	600
Spezia (<i>k</i>)	North Tyrrhenian Sea, Province of Genoa 44° 05' 34.6" N. 09° 49' 03.8" E.	ICS	—	Army	—
Stromboli	Island in the South Tyrrhenian Sea 38° 48' 10" N. 15° 14' 30" E.	IDE	120	Government	300, 600
S. Cataldo Di Bari ..	Coast of the South Adriatic Sea, Province of Bari 41° 08' 23" N. 16° 50' 47" E.	ICQ	120	Government	300, 600
Taranto (<i>k</i>)	Gulf of Taranto Ionian Sea 40° 28' 02" N. 17° 18' 07" E.	ICT	—	Army	—
Tempio	Sardinia 40° 53' 56" N. 09° 06' 08" E.	IDR	270	—	2,400 c.w.
Trieste Radio ..	45° 38' 54" N. 13° 45' 29" E.	IQX	200	—	300, 600
Turin	—	—	—	Army	—
Ustica	Island to the N. of Palermo 38° 42' 25" N. 13° 10' 45" E.	IDS	—	—	—
Venice Radio ..	45° 28' 50" N. 12° 21' 10" E.	ICZ	200	Government	300, 600
Verona	—	—	—	Army	—
Villa San Giovanni ..	Calabria Strait of Messina 38° 10' 00" N. 15° 38' 00" E.	IFV	—	Government	—
Vittoria Radio ..	Sicily, Province of Syracuse 36° 57' 00" N. 14° 32' 00" E.	ICV	270	Government	300, 600
JAMAICA. (See WEST INDIES)					
JAPAN (<i>see note l</i>)					
Choshi Radio	Hondo, Inuboye Point 35° 44' 08" N. 140° 51' 12" E.	JCS	550	Ministry of Communications	300, 600, 1,800
Dairenwan	Peninsula of Kwan-Tung 38° 57' 50" N. 121° 53' 15" E.	JDA	350	—	300, 600
Funabashi Radio ..	Tokyowan, near Funabashi	JJC	—	Ministry of Marine and Ministry of Communication	4,000, 7,000
Horomushiro Radio (<i>l</i>)	Paramousir Isl. 50° 29' 20" N. 156° 07' 30" E.	JHJ	550	Ministry of Communications	300, 600, 1,800
Iwaki Radio	Hondo, South of Sendai 37° 37' 10" N. 140° 56' 30" E.	JAA	5,000	Ministry of Communications	15,500 14,600 c.w.
Keelung Radio ..	Forinosa Island 25° 07' 58" N. 121° 45' 10" E.	JFK	1,000	Ministry of Communications	300, 450, 600, 1,800, 2,500 spk.
Komonto (<i>l</i>)	Chosen, Komonto Island 34° 05' 55" N. 126° 36' 12" E.	JKM	200	—	—

JAPAN—contd.

Maizuru Radio ..	Wakasa Bay, near Maizuru 35° 27' 00" N. 135° 19' 00" E.	JMZ	1,500	Ministry of Communi- cations	800, 1,500
Minamioagarima .. (1)	Borodino Islands 25° 51' 00" N. 131° 15' 00" E.	JYU	200	—	300, 600
Mokuho .. (1)	Chosen, Port of Mokpo 34° 47' 03" N. 126° 23' 05" E.	JMP	200	—	—
Osezaki Radio ..	Kyushyu, Goto Islands 32° 37' 20" N. 128° 37' 08" E.	JOS	550	Ministry of Communi- cations	300, 600, 1,800 spk.
Otchishi Radio ..	Hokkaido, Pacific Coast 43° 10' 17" N. 145° 30' 20" E.	JOC	550	Ministry of Communi- cations	300, 600
Otomari Radio ..	Saghalien Island 46° 36' 40" N. 142° 46' 46" E.	JTW	450	General Direction of Posts and Telegraphs	300, 600, 1,800 spk.
Rasajima ..	Rasa Islands 24° 29' 30" N. 131° 13' 00" E.	JSA	450	Ministry of Communi- cations	300, 600, 1,800 spk.
Shimotsui Radio ..	Hondo, Inland Sea, 34° 26' 30" N. 133° 48' 05" E.	JSX	300	Ministry of Communi- cations	300, 600, 1,800 spk.
Shiomisaki Radio ..	Hondo Kii Channel 33° 25' 32" N. 135° 46' 08" E.	JSM	450	Ministry of Communi- cations	300, 600
Shogetsubito .. (1)	Chosen, Port of Chemulpo 37° 28' 19" N. 126° 36' 20" E.	JSB	400	—	—
Shoseito .. (1)	Chosen, Island of Shoseito 37° 45' 36" N. 124° 43' 45" E.	JSS	300	—	—
Tsunoshima Radio ..	Hondo, near Shimonoseki 34° 21' 00" N. 130° 50' 00" E.	JTS	450	Ministry of Communi- cations	300, 600

**KENYA COLONY AND
PROTECTORATE**

Kismayu ..	00° 21' 57" S. 42° 33' 30" E.	VQQ	300	—	600
Mombasa ..	04° 03' 11" S. 39° 39' 51" E.	VPQ	350	Government ..	300, 600, 1,800

LABRADOR. (See
under **NEWFOUND-
LAND**)**LATVIA (LETTONIA)**

Liepaja ..	56° 32' 48" N. 21° 00' 36" E.	KCB	200	Post and Telegraphs ..	300, 600, 800, 1,200
Riga (T) ..	56° 56' 52" N. 24° 05' 24.6" E.	KCA	500	—	300, 600, 700, 1,400, spk. 400, 800, 1,500, 1,600 c.w.
Ventspils .. (see note m)	—	KCC	—	—	—

LIBERIA

Monrovia ..	06° 16' 40" N. 10° 49' 36" W.	FMA	400	French Government ..	600
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MACAO

S. Francisco ..	22° 11' 36" N. 113° 33' 42" E.	CRS	Day 50 Night 100	Port Authorities ..	300, 600
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MADAGASCAR					
Diégo-Suarez ..	North of Madagascar 12° 15' 04" S. 49° 22' 45" E.	HYD	Day 325 Night 650	French Government ..	300, 600
Dzaoudzi	Mayotta Island (Comoro Islands) 12° 46' 55" S. 45° 16' 29" E.	HYH	430	French Government ..	300, 600
Hellville	Nossi Bé Island, To the North-West of Madagascar 13° 24' 21" S. 48° 17' 19" E.	HYJ	160	Army	1,800 c.w.
Majunga	Mozambique Channel 15° 43' 00" S. 46° 20' 14" E.	HYE	430	French Government ..	300, 600
Mutsamudu	Johanna Comoro Islands 12° 09' 26" S. 44° 24' 27" E.	HYG	100	French Government ..	600
MADEIRA (PORTUGUESE)					
Funchal	32° 38' 11" N. 16° 54' 27" W.	PQU	190	Administration of Posts and Telegraphs of Portugal, Lisbon	300, 600
MAJORCA. (See under SPAIN)					
MALTA					
Calafrana	35° 48' 55" N. 14° 32' 16" E.	GHA	1,200	British Air Force ..	4,800 c.w.
Malta.. ..	35° 55' 15" N. 14° 29' 24" E.	VPT	200	Marconi's Wireless Telegraph Co. and Eastern Telegraph Co., London	300, 600, spk. 2,100 c.w.
Rinella	35° 53' 00" N. 14° 32' 00" E.	BYZ	—	British Admiralty ..	4,200 c.w.
S. Angelo	35° 53' 00" N. 14° 31' 00" E.	BYV	—	British Admiralty ..	—
MARIANNE ISDS. (See under PACIFIC ISLANDS)					
MARSHALL ISDS. (See under PACIFIC ISLANDS, JAPAN)					
MARTINIQUE (n) Fort de France (see note n)					
	14° 35' 50" N. 61° 04' 00" W.	HYV	300	Navy	600, 800, 1,000
MAURITIUS					
Mauritius	20° 10' 00" S. 57° 35' 00" E.	BZG	500	—	600
Tug Labourdonnais	Port Louis Harbour 20° 09' 24" S. 57° 29' 30" E.	VRK	100	—	300, 600
MEXICO					
Acapulco de Guerrero	16° 50' 41" N. 99° 54' 26" W.	XAK	300	Government	600, 900, 1,200
Alamos de Sonora ..	27° 01' 19" N. 108° 55' 59" W.	XAD	500	Government	600, 900, 1,200
Campeche	19° 51' 40" N. 90° 32' 14" W.	XAE	300	Government	600, 900, 1,200

MEXICO—contd.

Hermosillo	Sonora 29° 04' 28" N. 110° 57' 51" W.	XAH	300	—	300, 600, 900
Isla Maria Madre ..	Nayarit 21° 30' 45" N. 106° 33' 14" W.	XAO	300	Government	600, 900, 1,200
Mazatlan de Sinaloa	Sinaloa 23° 11' 55" N. 106° 25' 20" W.	XAE	300	Government	600, 900, 1,200
Mérida de Yucatán ..	20° 58' 05" N. 89° 37' 21" W.	XAM	300	Government	600, 900, 1,200
Payo Obispo ..	Quintana Roo 18° 29' 39" N. 88° 21' 30" W.	XAC	300	Government	600, 900, 1,200
Pas de la Baja, California (La) ..	Gulf of California 24° 10' 12" N. 110° 21' 05" W.	XAF	300	Government	600, 900, 1,200
Puerto Lobos	Vera Cruz 21° 28' 00" N. 97° 13' 03" W.	XAL	300	Government	600, 900, 1,200
Salina Cruz	Oaxaca 16° 09' 37" N. 95° 12' 11" W.	XAN	300	Government	600
S. Rosalia de la Baja, California	Lower California 27° 24' 00" N. 112° 20' 00" W.	XAG	100	Government	600
Tampico de Tamaulipas	22° 13' 00" N. 97° 51' 19" W.	XAJ	300	Government	600, 900, 1,200
Tuxpan de Veracruz	20° 57' 18" N. 97° 23' 59" W.	XAI	300	Government	600, 900, 1,200
Veracruz de Veracruz	19° 12' 02" N. 96° 08' 16" W.	XAA	500	Government	600, 900, 1,200

MOROCCO. (See also under **SPAIN**)

Agadir	30° 26' 15" N. 09° 36' 30" W.	CNA	400	French Navy	300, 600, 300
Casablanca Aerodrome (T)	5 Kilometres South of the El Hank L'h'se 33° 34' 12" N. 07° 40' 55" W. Appx.	CNO Casablanca	—	—	900, 1,400 c.w. 900 T'py.
Casablanca	Maroc 33° 36' 30" N. 07° 37' 00" W.	CNP	430	French Government ..	300, 600
Chétéba D.F. ..	33° 35' 21" N. 07° 34' 10" W.	CNP	—	French Navy	450
Kenitra D.F. ..	34° 18' 49" N. 06° 36' 00" W.	CNK	120	French Navy	450, 600, 800
Mogador	31° 31' 00" N. 09° 46' 00" W.	CNY	430	French Government ..	300, 600
Tangier	35° 47' 15" N. 05° 49' 00" W.	CNW	430	French Government ..	300, 600

MOZAMBIQUE
(PORTUGUESE
EAST AFRICA)

Beira	19° 50' 16" S. 34° 50' 48" E.	CRT	200	—	600, 900, 1,000
Buzi	Province of Mozambique 19° 52' 20" S. 34° 32' 00" E.	CRCC	25	Company of Mozam- bique	300, 350, 600, 800
Inhambane	23° 51' 55" S. 35° 22' 50" E.	CRY	300	Government	300, 600
Lourenço Marques ..	25° 58' 05" S. 32° 35' 39" E.	CRZ	300	Government	300, 600
Mozambique	Province of Mozambique 15° 01' 47" S. 40° 45' 06" E.	CRV	300	Government	300, 600
Quelimane	Province of Mozambique 17° 52' 03" S. 36° 52' 55" E.	CRW	200	—	600, 900, 1,000

NETHERLAND GUIANA (See under DUTCH GUIANA)					
NETHERLAND INDIES (See under DUTCH EAST INDIES)					
NETHERLANDS (See under HOLLAND)					
NEW BRITAIN (See under NEW GUINEA)					
NEW CALEDONIA					
Nouméa-Semaphore	22° 16' 20" S. 166° 26' 53" E.	HVV	Day 400	Government	300, 600
NEW HEBRIDES					
Port-Vila	17° 44' 06" S. 168° 19' 08" E.	HVW	380 1,350	—	300, 600, 1,800
NEWFOUNDLAND AND LABRADOR (See also under CANADA) (see note p)					
American Tickle .. .	Labrador 53° 28' 00" N. 55° 41' 00" W.	VOC	100	Marconi Co. of Canada	600
Battle Harbour ..	Labrador 52° 17' 00" N. 55° 36' 00" W.	VOA	150	Marconi Co. of Canada	300, 600
Cape Harrison ..	Labrador 54° 52' 00" N. 58° 03' 00" W.	VOH	150	Marconi Co. of Canada	600
Cape Ray (Radio Beacon)	47° 37' 02" N. 59° 18' 20" W.	—	50	—	1,000
Domino	Labrador 53° 28' 00" N. 55° 44' 00" W.	VOD	150	Marconi Co. of Canada	600
Fogo	Fogo Island 49° 42' 00" N. 54° 13' 00" W.	VOJ	250	Marconi Co. of Canada	300, 600
Grady	Labrador 53° 48' 00" N. 56° 23' 00" W.	VOE	150	Marconi Co. of Canada	600
Holton	Labrador 54° 35' 00" N. 57° 15' 00" W.	VOG	150	Marconi Co. of Canada	600
Makkovik	Labrador 55° 13' 00" N. 59° 08' 00" W.	VOI	150	Marconi Co. of Canada	600
Smokey Tickle ..	Labrador 54° 26' 00" N. 57° 11' 00" W.	VOF	150	Marconi Co. of Canada	600
S. John's	47° 31' 00" N. 52° 52' 00" W.	BZM	—	—	—
Venison Islands ..	53° 14' 00" N. 55° 46' 00" W.	VOB	100	Marconi Co. of Canada	600

NEW GUINEA (Late GERMAN NEW GUINEA)					
* ADMIRALTY ISLAND					
Manus Radio ..	02° 01' 50" S. 147° 17' 00" E.	VZO	200	—	300, 600 , 800
NEW BRITAIN (o)					
Rabaul Radio .. (see note o)	04° 23' 50" S. 152° 18' 15" E.	VJZ	1,000	Australian Government	600 800 , 2,500 spk. and Arc.
NEW GUINEA (BRITISH)					
Eitape Radio ..	03° 08' 02" S. 142° 21' 02" E.	VZX	200	Australian Government	300, 600, 800
Madang Radio ..	05° 12' 40" S. 145° 49' 30" E.	VIV	200	Australian Government	300, 600, 800
Misima Radio ..	10° 40' 00" S. 152° 50' 00" E.	VIX	120	Australian Government	300, 450, 600
Morobe Radio ..	07° 45' 30" S. 147° 39' 03" E.	VZK	200	Australian Government	300, 600, 800
Port Moresby Radio	09° 28' 00" S. 147° 09' 00" E.	VIG	500	Australian Government	300, 450, 600
Samarai Radio ..	10° 3' 49" S. 150° 39' 46" E.	VIJ	350	Australian Government	300, 450, 600
Woodlark Isld. Radio ²	09° 05' 00" S. 152° 45' 00" E.	VIF	1,000	Australian Government	300, 450, 600
NEW IRELAND					
Kaewiang Radio ..	02° 34' 30" S. 150° 48' 45" E.	VZR	200	Australian Government	300, 600, 800
SOLOMON ISLANDS					
Kieta Radio ..	Bougainville Isd. 06° 12' 15" S. 155° 39' 36" E.	VIU	200	Australian Government	300, 600, 800
Tulagi	09° 06' 40" S. 160° 09' 40" E.	VQJ	Day 400 Night 1,300	Australian Government	600, 1,800, 2,500 spk.
NEW HEBRIDES (See under NEW CALEDONIA)					
NEW IRELAND (See under NEW GUINEA)					
NEW ZEALAND					
Awanui	Auckland Mongonui 34° 54' 00" S. 173° 18' 00" E.	VLA	Day 500 Night 1,000	Gov. rnment	300, 600, 1,000, 2,000, 2,500, 3,500 spk.
Auckland Radio ..	36° 50' 37" S. 174° 46' 08" E.	VLD	325	Government	300, 600
Awarua	Otago, nr. Bluff Harb. 46° 30' 00" S. 168° 23' 00" E.	VLB	Day 300 Night 600	Government	300, 600 , 1,000, 2,000, 2,500, 3,500 spk.
Chatham Islands ..	43° 57' 02" S. 176° 31' 04" W.	VLC	300	Government	300, 600 , 1,600 spk.
Rarotonga	21° 12' 00" S. 159° 48' 30" W.	VMR	Night 500 Night 850 300	Government	300, 600 , 1,700 spk.
Wellington Radio ..	41° 17' 05" S. 174° 46' 39" E.	VLW	300	Government	300, 600
NICARAGUA					
Managua	12° 17' 00" N. 86° 17' 00" W.	NAZ	300	U.S. Navy-	600 , 975 , 1,832 spk.

NIGERIA						
Lagos.. ..	06° 26' 35" N. 03° 23' 55" E.	VPY	250	—		300, 600
NORWAY						
Bear Island ..	74° 30' 00" N. 20° 40' 00" E.	LWP	230	Private		600
Bergen Radio (D.F. ³) (T)	North Sea Coast 60° 24' 30" N. 05° 22' 00" E.	LGN	350 1,200 350	Government		300, 600 1,800 spk. 600, 1,800 1,850, c.w.
Christiania Radio (T)	59° 59' 01" N. 10° 40' 26" E.	LCH	700	Government		2,100 2,400, 2,900, T'py. 4,100, 5,450, 8,200 c.w.
Fauske Radio ..	Salten Fiord 67° 15' 28.1" N. 15° 23' 17.35" E.	LDW	200	Government		300, 600, 1,600, 1,800, 2,100 spk.
Flekkerøy Radio .. (T)	Skagerak, nr. Christiansand 58° 04' 05" N. 07° 59' 00" E.	LDF	160	Government		300, 600
Ingøy Radio (D.F. ³)	West of North Cape 71° 04' 25" N. 24° 09' 20" E.	LEI	480	Government		300, 600
Jan Mayen	71° 00' 00" N. 08° 50' 00" E.	JN	500	Government		1,000
Karljohansvern ..	Christiania Fjord	LBZ	—	Government		—
Lille Faerder Light- house	59° 01' 36" N. 10° 31' 54" E.	TRW	30			1,000
Röst (D.F. ³).. ..	Lofoden Islands 67° 30' 22.86 N. 12° 04' 33.79 E.	LFR	200	Government		300, 600, 1,600 spk.
Sörvagen	Lofoden Islands 67° 53' 30" N. 13° 02' 00" E.	LEN	35	Government		300, 600
Spitsbergen (D.F. ³)..	Green Harbour 78° 02' 26" N. 14° 14' 27" E.	LFG	400	Government		300, 600
Stavanger Radio ..	58° 56' 23" N. 05° 40' 39" W.	LCM	—	Government		12,140
Tjømø Radio ..	Christiania Fjord 59° 03' 05" N. 10° 24' 05" E.	LET	160	Government		600
Utsire Radio (D.F. ³)	North Sea Coast 59° 18' 10" N. 04° 55' 08" E.	LGK	230	Government		300, 600
Væroy	Lofoden Islands 67° 40' 00" N. 12° 41' 00" E.	LDB	20	Government		600
PACIFIC ISLANDS						
GILBERT AND ELLIS ISLANDS						
Ocean Island ..	00° 51' 47" S. 169° 34' 48" E.	VQK	1,000	Government of Colony		300, 600, 700, 1,650
CHATHAM I. LANDS						
Chatham Islands ..	43° 57' 00" S. 176° 57' 00" W.	VLC	300	Government		300, 600, 1,600
MARSHALL I. LANDS						
Nauru Radio ..	Pleasant Is. 00° 25' 24" S. 166° 57' 00" E.	VKT	1,000	Australian Administra- tion		600, 2,250 spk.
MARIANNE ISLANDS						
Guam	13° 27' 15" N. 144° 44' 42" E.	NPN	300-3,500	U.S. Navy		600 975, 2,250, 2,400, spk. 8,950, 3,950, 9,145, 11,500, 13,800 c.w.
TONGA (FRIENDLY I. LANDS)						
Nukualofa Radio ..	21° 07' 57.5 S. 175° 12' 05" W.	VSB	520	Government		300, 600, 1,200, 1,600

PANAMA**(a) PANAMA
REPUBLIC**

Cape Mala	07° 27' 30" N. 79° 59' 30" W.	NNT	300	U.S. Navy	600, 1,908
Palma (La)	Stanley Island 08° 26' 00" N. 78° 08' 30" W.	NNW	300	U.S. Navy	600, 1,815
Puerto Obaldia	09° 33' 00" N. 79° 13' 00" W.	NRK	300	U.S. Navy	600, 1,988

**(b) PANAMA
CANAL ZONE**

Balboa	Pacific Entrance of the Panama Canal 09° 07' 15" N. 79° 46' 20" W.	NBA	300, 3,000	U.S. Navy	600, 975, 2,250, 2,400, spk. 3,950 7,000, 9,800 10,110 10,510, 17,145 arc. 600, 975, 1,620
Colon	09° 21' 56" N. 79° 54' 01" W.	NAX	300	U.S. Navy	
Fort Amador	—	WUBE	25	U.S. Army	400
Fort de Lesseps	—	WUCG	25	U.S. Army	400
Fort Randolph	—	WUCI	—	—	400
Fort Sherman	—	WUCH	25	U.S. Army	400
France Field	—	WYP	250	U.S. Army	1,500

**PERSIA (see under
PERSIAN GULF)****PERSIAN GULF**

Bahrein	Bahrein 26° 13' 46" N. 50° 35' 28" E.	VTE	350	Indo-European Tele- graph Dept.	300, 600
Basrah Radio	Irak 30° 31' 00" N. 47° 52' 00" E.	VTC	400, 1,000	—	300, 600, spk. 3,000 c.w.
Bushire	Persia 28° 54' 36" N. 50° 49' 43" E.	VTF	350	Indo-European Tele- graph Dept.	300, 600
Henjam	Persia 26° 41' 14" N. 55° 53' 25.5" E.	VTH	300	Indo-European Tele- graph Dept.	300, 600
Lingah	Persia 26° 33' 34" N. 54° 53' 23" E.	VTL	300	Indo-European Tele- graph Dept.	300, 600

PERU

Cachendo	16° 56' 10" S.	OAB	540	Government	600, 1,500, 3,500 spk.
Callao	71° 51' 10" W. Littoral Province of Callao 12° 03' 53" S. 77° 11' 50" W.	OAA	160	Government	600
Casima	09° 20' 10" S. 78° 10' 50" W.	OAS	100-300	Government	750, 850 c.w.
Chala ^a	15° 51' 25" S. 74° 14' 00" W.	OAC	220	Government	600
Encanto (El)	Confluence of the Putumayo and Cara Parana 00° 58' S. a px. 73° 34' W. appx.	OAU	220	Marconi Company ..	2,000 spk.
Eten	Department of Lambayeque 06° 55' 29" S. 79° 53' 06" W.	OAG	220	Government	600, 1,500 spk.
Fronton	Littoral Province of Callao 12° 07' 25" S. 77° 14' 50" W.	OAF	16	Government	600
Ilo	Littoral Province of Callao 17° 36' 54" S. 71° 15' 00" W.	OAL	220	Government	600

PERU—*contd.*

Iquitos	Department of Loreto 03° 45' 57" S. 73° 12' 00" W.	OAY	810	Government	1,500, 4,000 spk.
Leticia	Department of Loreto 04° 11' 02" S. 69° 56' 13" W.	OAQ	220	Government	2,000 spk.
Lima (San Cristobal)	Department of Lima 12° 03' 65" S. 77° 04' 39" W.	OAZ	810	Government	600, 1,500, 3,500, 4,000 spk.
Magdalena del Mar ..	12° 05' 50" S. 77° 04' 55" W.	OAN	100-300	Government	750, 850 c.w.
Masisea	Department of Loreto 08° 37' 00" S. 74° 28' 35" W.	OAM	220	Government	2,000 spk.
Orellana ^a	06° 54' 55" S. 75° 13' 00" W.	OAQ	220	Government	2,000 spk.
Pisco	Department of Ica 13° 42' 45" S. 76° 16' 07" W.	OAP	160	Government	600
Puerto Bermudez ^a ..	10° 14' 21" S. 74° 59' 36" W.	OAE	220	Government	2 000 spk.
Puerto Maldonado .. (Receiving only)	Department of Madre de Dios 12° 35' 44" S. 69° 15' 40" W.	OAD	—	—	—
Trujillo	Department of Libertad 08° 07' 56" S. 79° 03' 40" W.	OAT	220	Government	600, 1,500 spk.

PHILIPPINE ISLANDS

Amuguis	13° 15' 00" N. 122° 40' 00" E.	KPB	300	Government	600, 1,000
Balabac	07° 59' 00" N. 117° 00' 30" E.	KEW	300	Philippine Insular Government	600, 1,200
Basco	20° 27' 30" N. 121° 59' 00" E.	KZAB	800	—	600, 1,200, 1,500, 1,800, 2,400 spk.
Batangas	13° 47' 00" N. 121° 00' 00" E.	KPC	1,000	Philippine Insular Government	3,000
Bongao	05° 02' 00" N. 119° 46' 00" E.	KEO	—	Philippine Insular Government	600, 952
Cagayan de Sulu ..	06° 30' 30" N. 118° 30' 30" E.	KEV	500	Philippine Insular Government	750
Calapan	Mindoro 13° 24' 30" N. 121° 11' 00" E.	KZAC	150	Philippine Insular Government	300, 600, 952
Camp Nichols ..	Rizal	WYT	250	—	250, 1,500
Camp Stotsenburg ..	—	WUCA	300	U.S. Signal Corps ..	600, 952
Cavite	14° 28' 59" N. 120° 54' 35" E.	NPO	300, 5,000	U.S. Navy	600, 975, 2,400, 2,702, spk. 3,950, 5,250, 9,145, 13,900 c.w.
Cebu	Cebu Islands 10° 18' 00" N. 123° 50' 00" E.	KPI	500	Philippine Insular Government	600, 1,200
Clark Field	Camp Stotsenburg	WYS	25, 150	U.S. Army	250, 450
Culion	Culion Island 11° 50' 00" N. 120° 02' 00" E.	KPJ	200	Philippine Insular Government	600, 1,200
Cuyo	10° 50' 00" N. 121° 00' 00" E.	KIX	150	Government	600, 1,200
Davao	Mindanao Island 07° 00' 00" N. 125° 30' 20" E.	KIF	200	Philippine Insular Government	600, 1,200
Fort Drum	Manila Bay El Fraile Island 14° 18' 23" N. 120° 37' 43" E.	WUAL	50	U.S. War Dept., Washington (D.C.)	825

PHILIPPINE ISLANDS—contd.

Fort Frank	Manila Bay, Carabao Island, 14° 16' 20" N. 120° 36' 45" E.	WVL	50	U.S. War Dept., Washington (D.C.)	500
Fort John Hay ..	—	WUCB	300	U.S. Army (Signal Corps)	600, 975, 1,200, 1,800
Fort Mills, WUAG ..	14° 22' 00" N. 120° 34' 00" E.	WUAG	500	—	600, 1,240 spk.
Fort Mills WVN ..	Corregidor Island 14° 22' 52" N. 120° 34' 40" E.	WVN	500	U.S. War Dept., Washington (D.C.)	1,240 spk.
Fort Wint	Grande Island 14° 46' 15" N. 120° 13' 25" E.	WUAK	200	U.S. War Dept., Washington (D.C.)	1,200 spk.
Iloilo	10° 40' 00" N. 122° 30' 00" E.	KPM	500	Philippine Insular Government	600, 1,200
Isabela de Dasilan ..	06° 40' 00" N. 121° 50' 50" E.	KPN	20	Government ..	200
Jolo	Jolo Island 06° 10' 00" N. 121° 00' 00" E.	KIL	200	Philippine Insular Government	600, 1,200, 1,900
Kindley Field ..	—	WYR	250	U.S. Army ..	1,500 c.w.
Lebak	06° 35' 00" N. 124° 05' 00" E.	KPX	—	Philippine Insular Government	600, 952-1,200
Malabang	Mindanao Island 07° 00' 00" N. 124° 05' 00" E.	KIZ	200	Philippine Insular Government	600, 1,200
Malangas	07° 42' 00" N. 123° 05' 00" E.	KPV	300	Philippine Insular Government	600, 900
Malita	Davao 06° 22' 00" N. 125° 36' 00" E.	KPW	200	Government ..	600, 1,200
Manila	Luzon 14° 35' 48" N. 120° 58' 47" E.	WUAJ	1,000	U.S. War Department, Washington (D.C.)	600
Mati	06° 57' 00" N. 126° 17' 00" E.	KPZ	—	Philippine Insular Government	600, 952
Olongapo	14° 49' 00" N. 120° 16' 49" E.	NPT	150	U.S. Navy ..	600, 975, 1,908 spk.
Puerto Princesa ..	Paraguay 09° 40' 00" N. 118° 40' 40" E.	KIV	150	Government ..	600, 1,200 spk.
Siasi	05° 32' 45" N. 120° 49' 15" E.	KED	—	Philippine Insular Government	600
San Francisco ..	Camotes 10° 38' 00" N. 124° 22' 00" E.	KPY	150	Government ..	300, 600
San José	Mindoro 12° 20' 30" N. 121° 00' 00" E.	KIY	200	Philippine Insular Government	600, 1,200
Zamboanga	Mindanao Island 06° 50' 00" N. 122° 03' 19" E.	KIW	400	Philippine Insular Government	1,220

POLAND

Cracow	50° 03' 51.9" N. 19° 58' 00" E.	KRK	870	Government ..	1,900, 2,000, 2,100 c.w.
Grudziadz	53° 30' 00" N. 18° 45' 03" E.	AXK	1,500	Ministry of Posts and Telegraphs, Warsaw	10,300 c.w.
Posen	52° 24' 30" N. 16° 56' 25" E.	AXJ	1,300	Government ..	800, 1,200, 1,800, 3,600, 3,900, 5,600, 2,000, 4,700, 7,000, 10,000, 10,600 spk. & arc.
Warsaw Central ..	52° 15' 50" N. 20° 52' 37" E.	AXL AXO	12,000 12,000	Government ..	18,000, 21,000 c.w.

PORTO RICO

Ceiba (T.)	18° 16' 00" N. 63° 39' 00" W.	WKK	150	Bureau of Insular Telegraph	300, 600 , 1,610 c.w.
Ensenada	17° 58' 15" N. 66° 55' 50" W.	WPR	400	South Porto Rico Sugar Co.	300, 450, 600 , 1,800 spk.
S. Juan	18° 28' 03" N. 66° 05' 40" W.	NAU	300, 1,000	U. S. Navy	600, 2,400, 2,750 spk. 3,950 4,850 8,875 9,145, 10,110 c.w. 360
S. Juan (T.)	—	WKAQ	—	Radio Corporation of Porto Rico	
Vieques (T.)	18° 09' 00" N. 65° 26' 33" W.	WGW	150	Bureau of Insular Telegraphs	300, 600 , 1,610 spk.

PORTUGAL

Lisbon Radio	38° 47' 11.1" N. 09° 23' 22.1" W.	PQL	190	Government	300, 450, 600 spk.
Monsanto	—	CTV	—	—	1,000, 2,400
Oporto	41° 10' 35.7" N. 08° 42' 15.9" W.	PQP	400	Government	300, 600 spk.
AZORES					
Corvo	39° 40' 10" N. 31° 07' 35" W.	PQC	65	Government	300, 600
Faial	38° 38' 00" N. 28° 44' 10" W.	PQH	130	Administration of Posts and Telegraphs, Lisbon	300, 600
Flores	39° 27' 35" N. 31° 08' 10" W.	PQF	130	Administration of Posts and Telegraphs, Lisbon	300, 600
S. Maria	36° 59' 55" N. 25° 08' 20" W.	PQK	65	Administration of Posts and Telegraphs, Lisbon	300, 600
S. Miguel	37° 44' 30" N. 25° 42' 50" W.	PQM	65	Administration of Posts and Telegraphs, Lisbon	300, 600
Terceira Radio	38° 39' 55" N. 27° 07' 34" W.	PQT	400	Government	300, 600, 900, 1,000
CAPE VERDE ISLANDS					
Boa Vista	Sal Rei 16° 10' 00" N. 22° 56' 00" W.	CRJ	200	—	300, 600 , 1,000 spk.
Praia	14° 55' 00" N. 22° 30' 00" W.	CRK	400	—	300, 600 , 800, 1,000, 1,530 spk.
Sal	Sta Maria 16° 35' 00" N. 22° 55' 00" W.	CRI	200	—	300, 600 , 1,000 spk.
S. Filipe	Togo 14° 52' 12" N. 24° 31' 55" W.	CRFF	250	Government	650, 800, 1,000 spk.
S. Vicente de Cabo Verde	16° 52' 44" N. 24° 59' 10" W.	CRF	450	Government	300, 600 , 1,000, 1,500, 2,000, 3,000 spk.

PORTUGUESE EAST AFRICA (See under **MOZAMBIQUE**)**PORTUGUESE GUINEA**

Bissau	11° 51' 30" N. 15° 35' 10" W.	CRA	190	—	300, 600
Bolama	11° 36' 00" N. 15° 30' 00" W.	CRB	200	Government	300, 600 , 800 spk.

ROUMANIA (q)

Bucharest	—	BUC	—	—	8,150 c.w.
Cerna-Voda	—	—	80	Military and Navy ..	800
Constanta-Tunnel	44° 10' 32" N. (see note q) 28° 39' 03" E.	CVAZ	240	State Maritime Service	300, 600
Galati	—	—	160	Military and Navy ..	1,200
Sulina T.S.F.	—	—	270	Military and Navy ..	1,500

RUSSIA

Anadyr	Behring Sea 64° 34' 00" N. 175° 35' 00" E.	RCD	130	Government	300, 420, 600
Archangel	Mouth of the Dwina 64° 32' 00" N. 40° 30' 00" E.	RCE	250	Government	300, 420, 600
Astrakhan	46° 22' N. appx. 48° 06' E.	RAA	450	Government	1,400 spk.
Astrakan Radio ..	Caspian Sea 45° 15' 00" N. 47° 25' 00" E.	RCR	110	Government	300, 420, 600
Bakhmout	—	REN	450	—	400, 2,500 spk.
Bakou	40° 22' N. appx. 49° 50' E.	RAB	450	Government	1,400
Batoum	Black Sea 41° 36' 00" N. 41° 40' 00" E.	RCF	—	Government	—
Detskoe Selo	—	RET	2,200	—	7,000 c.w.
Ekaterinburg	—	REZ	800	Government	1,500, 2,500 3,000 c.w. 2,500 spk.
Eriwan	40° 10' 16.5" N. 44° 30' 10.9" E.	RDY	1,200	—	—
Ermak	Petrograd 59° 56' 00" N. 30° 17' 00" E.	RBW	300	Government	300, 600 spk.
Feodosia	—	RAY	450	—	1,500 spk.
Feodosia Port	45° 01' 00" N. 35° 24' 00" E.	REK	200	—	300, 600, 2,100, spk.
Fort d'Alexandrovsk	Coast of the Caspian Sea 44° 30' 11" N. 50° 16' 40" E.	RCG	160	Government	300, 420, 600
Iokanga	67° 58' 00" N. 39° 38' 00" E.	RED	800	—	300, 600, 1,500 s. k.
Isakogorka	64° 27' 00" N. 40° 39' 00" E.	REA	400	—	300, 600, 1,740 1,900 s. k.
Kanin Nos.	68° 39' 20" N. 43° 18' 22" E.	REC	200	—	300, 600
Kerbinskaia	River Amgoun, a tributary of the Amur 52° 20' 07.3" N. 136° 29' 18" E.	RCH	70	Government	—
Kertch	Crimea 45° 18' 00" N. 36° 27' 00" E.	RCI	—	Government	—
Kharkow	49° 58' N. appx. 36° 12' E.	RAZ	1,500	Government	2,000 spk.
Kiew	50° 30' N. appx. 30° 28' E.	RAG	400	Government	1,500 spk.
Kouchka	—	RAH	500	Government	1,500 spk.
Krasnovodsk	40° 00' 00" N. 52° 59' 00" E.	RDZ	250	—	300, 600, 800, 3,000 spk.
Kronstadt	59° 59' 00" N. 29° 47' 00" E.	RCJ	—	Government	360
Mare-Sale	Kara Sea Yamal Peninsula 60° 42' 59" N. 66° 48' 38" E.	RCK	150	Government	300, 420, 600
Morjovets	66° 40' 00" N. 42° 30' 00" E.	REB	200	—	300, 600
Moscow. Imeni Komin- terna	55° 45' N. appx. 37° 37' E.	RDW	1,800	—	3,200 c.w.
Moscow. Imeni Mos- soveta	—	RAJ	2,500	Government	6,700 c.w.
Moscow. Oktiabrskaja ..	55° 47' N. appx. 37° 33' E.	RAI	2,000	Government	5,000 spk.
Mourmansk	68° 56' 00" N. 33° 05' 00" E.	REE	350	—	300, 600, 1,440 spk.
Naiakhan	Sea of Okhotsk 60° 33' 00" N. 159° 59' 00" E.	RCL	130	Government	300, 420, 600

RUSSIA—*cont'd.*

Nicolaiew	—	RAK	1,800	Government	3,500 spk.
Nicolaiewsk RCM ..	On the Amur	RCM	—	Government	—
Nicolaiewsk RCN ..	Mouth of the Amur 53° 08' 10.2" N. 140° 42' 5.4" E.	RCN	240	Government	300, 600
Novo-Nicolaievsk ..	—	RAL	1,000	Government	3,000
Novorossiisk	44° 46' 3.20" N. 37° 47' 19.70" E.	RDN	460	Government	300, 600, 1,100 spk.
Obdorsk	—	RAN	450	Government	1,400 spk.
Odessa	—	—	—	—	—
Odessa RDE	46° 29' 00" N. 30° 46' 00" E.	RDE	350	Government	600
Odessa Observatory	46° 28' 37.7" N. 30° 43' 53.9" E.	RDIH	250	Government	1,200
Okhotsk	Sea of Okhotsk 59° 22' 00" N. 143° 20' 00" E.	RCO	130	Government	300, 420, 600
Orenbourg	51° 46' N appx. 55° 07' E.	RAM	700	Government	3,000 spk.
Oufa	—	RAX	300	Government	1,200 spk.
Ourda	—	RES	250	—	450, 950, 1,500 spk.
Oust-Sysolsk	—	REG	250	—	1000 spk.
Petropavlovsk Radio	Kamchatka 53° 00' 10" N. 158° 38' 45" E.	RCP	130	Government	300, 600
Petrowsk Daghestan	Coast of the Caspian Sea 42° 59' 20" N. 47° 30' 00" E.	RCQ	160	Government	300, 420, 600
Petrozawodsk	61° 47' 18.9" N. 34° 23' 22.5" E.	RDI	200	Government	1,200
Poltava	—	REO	150	—	800, 1,500 spk.
Poti	42° 08' 30.5" N. 41° 39' 34.3" E.	RDX	450	—	300, 600, 1,500 spk.
Rostowdon	47° 15' N. appx. 39° 40' E.	RAO	450	Government	1,400 spk.
Samara	56° 11' N. appx. 50° 09' E.	RAQ	450	Government	1,500 spk.
Saratov	51° 35' N. appx. 46° 01' E.	RAP	600	Government	1,800 spk.
Sebastopol	44° 37' 00" N. 33° 33' 00" E.	RCT	—	Government	360
Semipalatinsk	50° 28' N. appx. 80° 13' E.	RBC	200	Government	1,200 spk.
Simbirsk	54° 23' N. appx. 48° 25' E.	RAR	400	Government	1,400 spk.
Simferopol	44° 58' N. appx. 34° 03' E.	RAT	200	Government	1,400 spk.
Smolensk	54° 50' N. appx. 32° 05' E.	RAS	460	Government	1,400 spk.
Sredne-Kolymsk	67° 10' 14" N. 157° 09' 50" E.	RDG	800	Government	2,000 spk.
Staraia Boukhara ..	39° 46' 37.32" N. 64° 25' 52.87" E.	RDJ	200	Government	800 spk.
Svobodnenskaia	—	RDU	1,400, 2,000	—	2,500 spk.
Taganrog	—	RAV	200	Government	1,200 spk.
Taganrog 2	Sea of Azov 47° 12' 00" N. 38° 48' 00" E.	RAV	170	Government	300, 420, 600 spk.
Taganrog Radio	Sea of Azov. 46° 59' 50" N. 38° 14' 10" E.	RCS	110	Government	300, 420, 600
Taschkent	41° 30' N. appx. 69° 20' E.	RAU	1,500	Government	4,000 spk.
Tchita	—	RDV	1,200	—	2,500 spk.
Tiflis	41° 41' 59" N. 44° 48' 16" E.	RDK	1,000	Government	2,500 spk.

RUSSIA—con'd.

Touapse	—	RAW	200	Government	1,200 spk.
Tscheliabinsk ..	—	RBB	1,000	Government	3,000 spk.
Tsyb.-Navolok ..	68° 56' 00" N. 33° 05' 00" E.	REF	200	—	300, 600 , 900 spk.
Tver (reception only)	56° 52' N. appx. 35° 48' E. "	RCC	200	Government	1,200
Tzaritzyn	—	RBA	450	Government	1,500 spk.
Vaigatch	Vaigatz Island Kara Strait 70° 23' 46" N. 58° 48' 00" E.	RCU	150	Government	300, 420, 600
Viatka	—	RAE	300	Government	1,200 spk.
Vladikavkaz ..	40° 03' N. appx. 44° 42' E. "	RAF	200	Government	1,200 spk.
Vladivostok RCV ..	43° 06' 00" N. 131° 54' 00" E.	RCV	—	Government	1,200 spk.
Vladivostok RCW	43° 06' 49.2" N. 131° 53' 22.5" E.	RCW	—	Government	360
Vologda	—	RAD	200	Government	1,200 spk.
Yougorski-Char ..	Kara Sea Jugor Strait 69° 49' 07" N. 60° 45' 42" E.	RCX	150	Government	300, 420, 600

SAINT LUCIA. (See
under **BRITISH
WEST INDIES**)**SAINT PIERRE
AND MIQUELON
ISLANDS**

S. Pierre Island ..	S. Pierre Island 46° 46' 00" N. 56° 10' 00" W.	HYS	50	Government	600
Miquelon	Miquelon Island 47° 07' 00" N. 56° 24' 00" W.	HYT	Day 80	Government	600

SAMOA ISLANDS

Apia Radio	13° 51' 00" S. 171° 48' 00" W.	VMG	500	New Zealand Adminis- tration	300, 600 , 2,000 spk.
Ofu	Samoa 14° 11' 30" S. 169° 40' 50" W.	NGX	—	U.S. Navy	300, 600
Tau	14° 15' 00" S. 169° 33' 15" W.	NCM	—	U.S. Navy	300, 600
Tutuila	14° 16' 30" S. 170° 42' 00" W.	NPU	300-2,300	U.S. Navy	600 , 975, 2,250, 2,400, spk. 3,950 , 4,525 c.w.

SARAWAK. (See
under **BRITISH
NORTH BORNEO**)**SERBS, CROATS
AND SLOVENES
(KINGDOM OF)**

Belgrade	44° 47' 57" N. 20° 21' 57.5" E.	IIFB	645	—	6,000-7,000,
Herzegovina	42° 27' 00" N. 18° 32' 14" E.	UNK	400	—	600 , 1,800
Parcevo (T.) ..	44° 00' 00" N. 21° 00' 00" E.	UNBB	160	—	1,000
Sarajevo	43° 51' 00" N. 18° 26' 00" E.	HFC	645	—	600, 2,800, 2,600 6,000
Sibenik	43° 43' 30" N. 15° 54' 12" E.	UNS	265	—	600 , 1,200
Skoplje	42° 00' 18" N. 21° 25' 30" E.	HFS	—	—	2,500, 4,000

SIAM

Bangkok	13° 44' 30" N. 100° 32' 00" E.	HGA	Day 300 Night 600	Government	300, 600, 1,600, 1,000 spk.
Red Light Ship I ..	Mouth of the Menam Chao Pra-ya 13° 27' 00" N. 100° 33' 40" E.	HGR	50	—	300, 600
Singora	Gulf of Siam Malay Peninsula 07° 12' 00" N. 100° 38' 00" E.	HGB	Day 300 Night 600	Government	300, 600, 1,600, 1,800 spk.

SIBERIA. (See under
RUSSIA)**SIERRA LEONE**

Sierra Leone.. ..	08° 29' 48" N. 13° 13' 55" W.	VPU	250	—	300, 600
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SOLOMON ISLANDS.
(See under **NEW**
GUINEA)**SOUTH AFRICA**
(**UNION OF**)

Capetown Radio ..	Province of the Cape of Good Hope 34° 08' 45" S. 18° 19' 17" E.	VNC	350	Government	300, 600
Dassen Island Radio	33° 26' 00" S. 18° 05' 00" E.	VNF	45	—	600
Durban Radio ..	Province of Natal 29° 49' 15" S. 31° 01' 20" E.	VND	250	Government	300, 600
East London Radio	Province of the Cape of Good Hope 33° 01' 45" S. 27° 54' 59" E.	VNO	60	—	300, 600
Jacobs Natal Radio ²	Prov. of Natal, near Durban 29° 55' 40" S. 30° 58' 50" E.	VNI	—	—	—
Port Elizabeth Radio	Province of the Cape of Good Hope 33° 57' 16" S. 25° 35' 30" E.	VNQ	300	Government	300, 600, 1,200
Port Nolloth Radio ²	20° 14' 00" S. 16° 52' 00" E.	VNJ	—	—	2,000

**BRITISH SOUTH-
WEST AFRICA**

Walvis Bay Radio	22° 57' 53" S. 14° 30' 08" E.	VNV	Day 750 Night 1,500	—	300, 600, 900 1,600, 2,000
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SPAIN (r) (and
BALEARIC ISDS.)

Los Alcazares	37° 44' 20" N. 00° 51' 17" W.	ECLD	300	Army	600, 900, 1,200, 1,500
Almeria	36° 51' 00" N. 02° 31' 15" W.	EGA	220	Army	600, 900
Aranjuez	40° 01' 48" N. 03° 04' 32" W.	FAA	430	Compania Nacional de Telegrafia sin Hilos	300, 600, 2,130 3,800, 6,700 c.w.
Barcelona	41° 23' 08" N. 02° 03' 52" E.	EGE	430	Army	600, 1,000, 1,600
Barcelona Radio ..	41° 18' 42" N. 02° 06' 28" E.	EAB	430	Compania Nacional de Telegrafia Sin Hilos	300, 600, 2,300 2,350 c.w.
Bilbao ¹	43° 23' 53" N. 02° 55' 34" W.	EGH	320	Army	600, 1,200, 1,500

SPAIN—*contd.*

Cabo de Palos ..	Murcia 37° 38' 00" N. 00° 40' 00" W.	EAP	202	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800
Cabo Finisterre ..	42° 52' 40" N. 09° 16' 18" W.	EAF	210	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800
Cabo Mayor ..	Santander 43° 30' 00" N. 00° 00' 00" W.	EAS	108	Compania Nacional de Telegrafia sin Hilos	300, 600, 1,800
Cádiz ..	36° 12' 30" N. 00° 17' 42" W.	—	6	—	70
Cádiz Radio ..	36° 20' 45" N. 06° 16' 14" W.	EAC	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,540
Carraca (La) ..	Gulf of Cadiz 36° 20' 30" N. 06° 10' 50" W.	CLZ	60	Navy	300, 600, 1,200
Cartagena ..	37° 35' 36" N. 00° 51' 18" W.	EBX	210	Navy	600, 900, 1,000, 1,200, 1,100
Coruna ..	43° 24' 29" N. 08° 24' 13" W.	EGJ	430	Army	600, 1,200, 1,500
Cuatro Vientos A. (see note r).	40° 22' 30" N. 03° 46' 27" W.	ECLA	300	Army	600, 900, 1,200, 1,500
Ferrol (Le) ¹ ..	43° 28' 52" N. 08° 14' 05" W.	EBW	440	Navy	600, 900, 1,200, 1,600, 1,800
Getafe ..	40° 18' 15" N. 03° 43' 24" W.	ECLC	25	Army	600, 700, 800
Guadalajara ..	40° 37' 54" N. 03° 10' 09" W.	EGZ	54	Army	900
Madrid EBZ ..	40° 25' 00" N. 03° 43' 00" W.	EBZ	15	Navy	225, 300
Madrid EGC ..	40° 22' 03" N. 03° 4' 0" W.	EGC	540	Army	1,600, 2,000, 2,500 2,500
Madrid (Military Aircraft Direction Finding) (see note r).	40° 25' 30" N. 03° 41' 18" W.	ECLB	25	Army	600, 700,
Madrid Ciudad Lineal	—	CLR	600	Navy	900, 2,000
Mahon CLM ..	Minorca 39° 51' 37" N. 04° 22' 38" E.	CLM	300	Navy	600, 900, 1,800
Mahon EGI ¹ ..	Minorca 39° 52' 29" N. 04° 22' 39" E.	EGI	320	Army	600, 1,200, 1,500
Malaga ..	36° 42' 51" N. 0° 23' 37" W.	EGM	90	Army	900, 1,200, 1,500 2,100 70
Matagorda .. (see note r).	Gulf of Cadiz 36° 31' 30" N. 06° 14' 54" W.	—	6	—	—
Seville ..	37° 21' 50" N. 05° 00' 47" W.	ECLE	300	Army	600, 900, 1,200, 1,500
Soller Radio ..	Majorca 39° 45' 15" N. 02° 45' 40" E.	EAO	270	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600
S. Fernando ..	Cadiz	EBV	—	—	—
Valencia ..	39° 27' 10" N. 00° 22' 46" W.	EGG	320	Army	600, 1,200, 1,500
Vigo ² ..	42° 15' 00" N. 08° 40' 00" W.	EAV	430	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,500
(b) COLONIES (MOROCCO, CANARY ISLANDS, &c.)					
Alhucemas ..	Morocco 35° 13' 00" N. 03° 30' 00" W.	EGO	160	Army	900, 1,200
Cabo Juby ..	Morocco 27° 56' 00" N. 13° 0' 30" W.	EGL	170	Army	900, 1,200, 1,500
Ceuta ..	Morocco 35° 48' 40" N. 05° 16' 24" W.	EGD	320	Army	900, 1,200, 1,500 2,100
Larache ..	Morocco 35° 12' 00" N. 06° 12' 00" W.	EGF	220	Army	900, 1,200, 2,100 1,500

SPAIN—contd.

Melilla	Morocco	EGB	320	Army	00, 1,200, 1,500 2,100
	35° 18' 15" N. 02° 56' 25" W.				
Palmas Radio (Las)	28° 00' 00" N. 15° 22' 00" W.	EAL	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,540
Santa Isabel de Fer- nando Pó	Territories in the Gulf of Guinea	EAY	130	Government (Foreign Office)	00, 0 900
	03° 46' 00" N. 08° 48' 40" E.				
Tenerife Radio ..	Santa Cruz	EAT	860	Compania Nacional de Telegrafia sin Hilos, Madrid	300, 600, 2,100, 2,540
	28° 08' 30" N. 16° 15' 00" W.				
Tetuán	Morocco	EGK	350	Army	900, 1,200, 1,500 1,590
	35° 33' 30" N. 05° 22' 30" W.				
Villa Cisneros ..	Rio de Oio	EGN	600	Spanish Station of the Ministry of War	600, 900, 1,200, 1,600
	23° 40' 43.4" N. 15° 54' 03.5" W.				

STRAITS SETTLEMENTS

CHRISTMAS ISLD. Christmas Island ..	10° 25' 19" S. 105° 42' 57" E.	VSM	Day 800 Night 1,500	The Christmas Island Phosphate Company	1,800, 2,200, 3,200, 3,400, 3,700 c.w.
Penang Radio ..	05° 32' 03.12" N. 100° 22' 51.14 E.	VPX	Day 350 Night 700, 1,200	Government	600, 1,030, s.k. 2,225 c.w.
Seletar	Singapore	BXW	—	—	—
	01° 23' 27.53" N. 103° 51' 49.24" E.				
Singapore Radio ..	Pyar Laebar	VPW	Day 350 Night 700	Government	600, 1,800
	01° 20' 25 6" N. 103° 53' 25 26" E.				

COCOS - KEELING ISLANDS

Cocos	Indian Ocean	VPK	150	Marconi International Marine Communication Co., Eastern Extension Australia and China Telegraph Co.	300, 600
	12° 05' 24" S. 96° 53' 20" E.				

SUDAN. (See under EGYPT.)**SWEDEN (s)**

Boden Radio .. (see note s).	Near Lulea	SAI	200	State Telegraphs ..	300, 600
	65° 50' 40" N. 21° 38' 50" E.				
Göteborg Radio ..	57° 40' 44" N. 11° 54' 00" E.	SAB	350	State Telegraphs ..	300, 600
Gottland Radio ..	Gothland	SAE	420	Marine Department ..	300, 600
	57° 43' 4" N. 18° 35' 50" E.				
Grundkullen Lightship (see notes.)	Gulf of Bothnia	SAK	55	—	300, 450, 600
	South Quarken				
	60° 29' 50" N. 18° 54' 30" E.				
Hälsö D F ..	Sälska	SAM	—	State Telegraphs ..	600
	58° 20' 08" N. 11° 13' 00" E.				
Harnosand Radio .. (see notes.)	Gulf of Bothnia	SAH	350	State Telegraphs ..	300, 600
	62° 44' 17" N. 18° 07' 47" E.				
Karlsborg Radio ..	Lake Vettern	SAJ	—	—	—
	58° 29' 18" N. 14° 28' 44" E.				
Karlskrona Radio	56° 09' 09" N. 15° 35' 23" E.				
Olandsrev Lightship (see notes.)	Near the Extreme South of Oland	SAG	55	—	300, 450, 600
	56° 07' 00" N. 16° 34' 00" E.				

SWEDEN—con't.					
Trälleborg Radio	55° 22' 13" N. 13° 09' 46" E.	SAC	250	State Railways ..	300, 875, 600
Vaxholm Radio	Archipelago of Sto kholm 59° 24' 15" N. 18° 21' 50" E.	SAF	350	State Telegraphs ..	300, 1600
Vinga, Swed D.F. ...	Kattegat, near Gothenburg 57° 38' 00" N. 11° 36' 10" E.	SAL	—	State Telegraphs ..	600
SWITZERLAND					
Berne	47° 00' 52" N. 07° 26' 37" E.	HBB	—	Posts and Telegraphs (Federal Dept.)	3,400 c.w.
Genève-Cointrin (T)	46° 13' 45" N. 06° 06' 04" E.	HB 1	—	—	1,400, 1,600, 900, 1,200 c.w.
Lausanne-Champ-de L'Air (T)	46° 31' 25" N. 06° 13' 25" E.	HB 2	—	—	1,400, 900, 1,100 c.w.
SYRIA AND LEBANON					
Bevrouth T.S.F.	33° 46' 00" N. 35° 25' 00" E.	FFD	200	—	300, 600
TIMOR (PORT GUEST)					
Dili	8° 33' 00" S. 125° 15' 40" E.	CRE	500	—	200, 300, 600
TONGA ISLANDS (See under PACIFIC ISLANDS)					
TRINIDAD. (See under BRITISH WEST INDIES)					
TRIPOLITANA AND CYRENAICA					
TRIPOLITANA					
Tripoli Radio ..	32° 52' 40" N 13° 11' 40" E.	ICK	160, 300	Government	300, 600
CYRENAICA					
Bengasi Radio ..	32° 06' 14" N. 20° 03' 15" E.	ICJ	300 160-300	Government	2,400 c.w. 300, 600
Cirene Radio ..	32° 48' 40" N. 21° 48' 00" E.	IDN	120	Government	300, 600
Derna Radio ..	32° 44' 54" N. 22° 39' 46" E.	ICO	270	Government	300, 600
Tobruclı Radio ..	32° 03' 30" N. 24° 00' 00" E.	ICU	270	Government	300, 600
TUNIS					
Bizerte-Setiè-Meriem	37° 14' 50.9" N. 09° 50' 08.2" E.	FFW	300	French Navy ..	300, 600, 800 spk.
Bizerte-Sidi-Abdallah	37° 09' 38.6 N. 09° 48' 18" E.	FUA	800, 1,200	French Navy ..	1,350 spark 5,150 arc.
Setiè-Meriem D.F. ...	37° 14' 42.5" N. 09° 50' 02.8 E.	FEQ	—	French Navy ..	450, 600, 800
TURKS and CAICOS ISLDS. (See under BRITISH WEST INDIES)					

UNITED STATES OF AMERICA (t)					
Aberdeen	Washington 46° 59' 00" N. 123° 50' 00" W.	KZE	300	—	400, 450, 550. 600
Amagansett	New York State 40° 58' 10" N. 72° 07' 27" W.	NBM	200	U.S. Navy	600, 975, 1,851
Amagansett D.F. ..	—	NBM	150	U.S. Navy	375
Anacostia NOF ..	District of Columbia	NOF	—	—	Variable
Anacostia NSF D.F.	District of Columbia	NSF	100	U.S. Navy	375
Anacostia NSF ..	District of Columbia 38° 52' 21" N. 77° 00' 11" W.	NSF	200	U.S. Navy	507 c.w.
Annapolis NAK ..	Maryland 38° 59' 00" N. 76° 27' 00" W.	NAK	150	U.S. Navy	1,620
Annapolis NZO ..	Maryland	NZO	—	—	Variable
Arroyo Park Camp (T)	34° 13' 48" N. 118° 10' 42" W.	KEY	50	U.S. War Dept. ..	1,650
Baltimore (T) ..	Maryland	WEQ	150	—	731, 909
Bar Harbor NBD ..	Otter Cliffe Maine 44° 14' 15" N. 68° 18' 00" W.	NBD	300, 1,000	U.S. Navy	300, 600, 975, 2,250, 2,400, spk.
Bar Harbor NBD D.F.	Maine 44° 18' 36" N. 68° 11' 27" W.	NBD	150	U.S. Navy	375
Barnegat	New Jersey 39° 33' 00" N. 74° 23' 00" W.	WCI	4,000	Radio Corporation of America.	300, 600, 16,700
Baytown	Texas 29° 44' 20" N. 95° 00' 30" W.	KDPS	200	—	300, 600 706
Beaumont	Texas 30° 08' 00" N. 93° 58' 00" W.	WOD	250	—	300, 600, 706
Bellefonte	Pennsylvania	WWQ	250	Post Office	3,446, 3,998
Bethany Beach D.F.	Delaware 38° 32' 45" N. 75° 03' 22" W.	NSD	150	U.S. Navy	375
Big Creek KRY (T) ..	California 37° 16' 00" N. 118° 58' 00" W.	KRY	75	—	1,764
Big Creek KVP (T) ..	California 37° 19' 00" N. 119° 02' 00" W.	KVP	75	—	1,764
Bird Island D.F. ..	California 37° 49' 27" N. 122° 32' 12" W.	NLD	150	U.S. Navy	375
Bolinas KET ..	California 37° 54' 30" N. 122° 40' 45" W.	KET	4,000	Radio Corporation of America	13,345
Bolling Field ..	District of Columbia	WYB	250	U.S. Army	1,500
Boston NAD ..	Massachusetts 42° 23' 26" N. 71° 03' 01" W.	NAD	300, 1,000	U.S. Navy	600, 975, 1,363, 3,950, 5,000
Boston WBF (T) ..	Massachusetts 42° 21' 19" N. 71° 03' 40" W.	WBF	500	Tropical Radio Telegraph Company	300, 600, 1,800
Boston WVO ..	Massachusetts 42° 21' 19" N. 71° 03' 40" W.	WVO	50	Government U.S. Signal Corps	674
Bowling Green (T) ..	Kentucky 36° 59' 00" N. 86° 20' 00" W.	WJAV	300	—	1,790
Brownsville	Texas 25° 52' 00" N. 97° 26' 00" W.	NAY	300-600	U.S. Navy	600, 952, 2,250, spk. 2,400, 3,947, 5,000 ar

Appx.

UNITED STATES OF
AMERICA—*contd.*

Bryan	Ohio	KDEL	—	Post Office .. .	8,295, 3,998
Buffalo	New York State 42° 53' 00" N. 78° 53' 00" W.	WGR	100	Federal Telephone and Telegraph Company	600
Burrwood	Louisiana 28° 57' 47" N. 89° 22' 57" W.	WBW	—	Tropical Radio Tele- graph Company, Boston	300, 600, 1,713
Butte	Montana 46° 00' 00" N. 112° 37' 00" W.	KMN	200	Montana Power Co. ..	550, 1,700
Camp 60 (T)	California 37° 15' 00" N. 119° 09' 00" W.	KDPV	50	Southern California Edison Company	527, 1,650
Camp 61 C	California 37° 18' 30" N. 119° 05' 00" W.	KFM	50	Southern California Edison Company	527, 1,650
Camp 61 (T)	California 37° 18' 30" N. 119° 05' 00" W.	KDPW	50	Southern California Edison Company	527, 1,650
Camp Alfred Vail ..	New Jersey	WUBA	300	U.S. Signal Corps ..	1,090, 1,500
Camp Grant	Illinois	WUBB	25	—	900
Camp Jones	Arizona	WZM	50	—	1,091
Camp Knox	Kentucky	WUBC	200	U.S. War Dept. Signal Corps	975
Camp Marfa	Texas	WUG	1,000	U.S. War Dept. Signal Corps	3,800
Camp S. D. Little ..	Arizona	WZL	50	—	1,091
Cape Cod	Massachusetts 42° 02' 28" N. 70° 04' 32" W.	NAE	1,000	—	300, 600
Cape Elizabeth D.F.	Portland Maine 43° 33' 59" N. 70° 11' 59" W.	NAB	150	U.S. Navy .. .	375
Cape Hatteras NDW	North Buxton, Carolina 35° 14' 22" N. 75° 31' 42" W.	NDW	150	U.S. Navy .. .	600, 975, 1,620
Cape Hatteras NDW D.	North Carolina 35° 14' 22" N. 75° 31' 42" W.	NDW	150	U.S. Navy .. .	375
Cape Henlopen D.F.	Delaware 38° 47' 35" N. 75° 05' 26" W.	NSD	150	U.S. Navy .. .	375
Cape Lookout D.F...	North Carolina 34° 36' 11" N. 76° 32' 18" W.	NAN	150	U.S. Navy .. .	375
Cape May D.F. ..	N.J. 38° 55' 53" N. 74° 54' 35" W.	NSD	150	U.S. Navy .. .	375
Cape May WCY ..	New Jersey 38° 55' 50" N. 74° 55' 50" W.	WCY	300	Radio Corporation of America, New York	300, 600, 1,610
Cascada (T)	California 37° 12' 00" N. 119° 14' 00" W.	KDPU	200	Southern California Edison Company	527, 1,650
Casper (T)	Wyoming 42° 52' 00" N. 106° 20' 00" W.	KDC	200	—	1,689
Cattle Point ² D.F. ..	Washington 48° 27' 04" N. 122° 57' 45" W.	NFN	100	U.S. Navy .. .	375
Chanute Field ..	Illinois	WYJ	250	—	674, 1,500
Charleston	South Carolina 32° 51' 36" N. 79° 57' 49" W.	NAO	300-1,000	U.S. Navy .. .	600, 975, 2,600, 2,400 spark, 365, 3,950, 4,800 c.w.
Chatham	Massachusetts 41° 42' 11" N. 69° 58' 56" W.	WIM	350	Radio Corporation of America	300, 600, 706
Cheboygan	Michigan 45° 00' 00" N. 83° 00' 00" W.	KUXM	100	—	300, 600, 1,599

UNITED STATES OF AMERICA—contd.					
Cheyenne	Wyoming	KDEG	250	Post Office	3,123, 3,998
Chicago WBU (T) ..	Illinois 41° 52' 26" N. 87° 37' 20" W.	WBU	200	—	420 C.W.
Chicago WVT	Illinois	WVT	250	U.S. Army	1,364
Clearwater KNR ..	33° 53' 45" N. 118° 09' 40" W.	KNR	1,000	—	3,375, 4,200, 5,500
Clearwater KOK ..	California 33° 53' 45" N. 118° 09' 40" W.	KOK	500	Federal Telegraph Co.	300, 600, 1,800
Cleveland KDPM T	Ohio 41° 30' 00" N. 81° 44' 00" W.	KDPM	100	—	360 300, 600, 1,817
Cleveland WTK ..	Ohio 41° 55' 00" N. 81° 44' 00" W.	WTK	300	—	300, 600, 706, 1,764
Cleveland WWO ..	Appx. Ohio	WWO	—	—	3,795, 3,998
Coram Hill	New York State 40° 55' 45" N. 72° 56' 30" W.	WQL	4,000	Radio Corporation of America	17,500
Cranston (T)	Rhode Island	WKAP	—	—	300, 360, 475, 600
Culver City KYI (Portable) (T.)	—	KYI	25	Goldwyn Producing Corpn.	146
Culver City KYJ (Portable) (T.)	—	KYJ	25	Goldwyn Producing Corpn.	146
Dahlgren	Virginia	NDY	—	—	347
Davenport (T) ..	Iowa 41° 30' 00" N. 90° 38' 00" W.	WOC	150	Palmer School of Chiropractic	400, 485, 674
Dearborn (T) ..	Michigan 42° 18' 00" N. 83° 14' 00" W.	KDEN	150	Henry Ford	300, 600, 1,713
Deer Island D.F. ..	Massachusetts 42° 21' 16" N. 70° 57' 29" W.	NAD	150	U.S. Navy	375
Detour Point D.F. ..	Michigan 45° 57' 20" N. 83° 54' 54" W.	NZU	100	U.S. Navy	375
Detroit KDPH (T)	Michigan 42° 20' 05" N. 83° 03' 40" W.	KDPH	150	—	300, 600, 1,621
Detroit WWJ ..	Michigan 42° 19' 40" N. 83° 15' 00" W.	WWJ	150	—	300, 600, 750
Eagle Harbor ..	Michigan 47° 27' 53" N. 88° 08' 43" W.	NUG	100	U.S. Navy	375
Douglas	Arizona	WZM	100	U.S. Army	1,100 (variable)
East Hampton ..	New York 40° 57' 28" N. 72° 12' 33" W.	WSA	900	—	300, 600
East Moriches ..	New York State 40° 48' 00" N. 72° 46' 05" W.	WSE	1,000- 1,600	—	300, 600, 2,500
East Pittsburgh (T) ..	Pennsylvania 40° 24' 00" N. 79° 50' 00" W.	KDKA	300	—	360, 1,817
Eldorado (T)	Kansas	WAH	200	—	360, 485, 1,599
Elko	Nevada	KDEJ	—	Post Office	3,407, 3,998
Empire D.F. ..	Oregon 43° 23' 03" N. 124° 18' 58" W.	NPF	150	U.S. Navy	375
Eureka NPW ..	California Table Bluff 40° 41' 45" N. 124° 16' 24" W.	NPW	450-600	U.S. Navy	600, 975, 2,250, spk. 2,400, 2,650 3,950 arc.
Eureka NPW D.F. ..	California 40° 41' 48" N. 124° 16' 34" W.	NPW	150	U.S. Navy	375

UNITED STATES OF AMERICA— <i>contd.</i>					
Everett	Washington 48° 00' 00" N. 122° 15' 00" W.	KFT	300	American Tugboat Co.	300, 600, 1,641
Fairfield	Ohio	WYD	250	U.S. Army	1,500
Fairport	Virginia 37° 49' 53" N. 76° 17' 26" W.	KDAH	175	—	300, 450, 600
Farallon Island D.F.	California San Francisco Entrance 37° 41' 58" N. 122° 59' 56" W.	NPI	150	U.S. Navy	375
Fire Island D.F. ..	New York State 40° 38' 07" N. 73° 12' 32" W.	NAH	150	U.S. Navy	375
Flagship, Division I, Camp Eustis (T)	Virginia 37° 08' 00" N. 76° 35' 00" W.	WPF	20	U.S. Shipping Board	300, 476, 600
Folly Island D.F. ..	South Carolina 32° 41' 00" N. 79° 53' 22" W.	NZV	100	U.S. Navy	375
Fort Adams	Rhode Island	—	—	—	1,150
Fort Andrews	Massachusetts 42° 08' 04" N. 70° 55' 44" W.	WUA	200	U.S. Army (Signal Corps)	1,091
Fort Barrancas	Florida 30° 20' 43" N. 87° 18' 05" W.	WZD	200	U.S. Navy (Signal Corps)	1,090
Fort Benjamin Harrison	Indiana	WVS	250	U.S. Army, War Dept.	1,559
Fort Bliss	Texas 31° 45' 00" N. 106° 00' 00" W.	WZO	2,000	U.S. Army (Signal Corps)	3,100
Fort Bragg	North Carolina	WZG	300	—	1,380
Fort Brown	Texas Brownsville	WUZ	250	U.S. Army (Signal Corps)	1,350-7,000
Fort Casey	Washington, Puget Sound	WZJ	50	U.S. Army (Signal Corps)	1,090
Fort Caswell.. ..	North Carolina	WUT	50	U.S. Army	825
Fort Clark	Texas	WZB	25	—	674
Fort Constitution ..	New Hampshire 43° 04' 16" N. 70° 42' 40" W.	WZE	50	U.S. Army (Signal Corps)	1,300
Fort Crockett	Texas 29° 16' 28" N. 94° 48' 52" W.	WUX	50	U.S. Army (Signal Corps)	1,090
Fort Dade	Florida 27° 35' 41" N. 82° 45' 45" W.	WZK	25	U.S. Army (Signal Corps)	825
Fort D. A. Russell ..	Wyoming	WVW	250	War Department ..	1,412
Fort des Moines	Iowa	WZT	—	—	800
Fort Douglas	Utah	WVX	250	U.S. Army	2,725
Fort du Pont	Delaware 39° 34' 10" N. 75° 35' 20" W.	WZN	50	U.S. Navy (Signal Corps)	300, 825
Fort Ethan Allen ..	Vermont	WUIA	50	U.S. Army	1,090
Fort Hancock	New Jersey 40° 37' 57" N. 73° 13' 08" W.	WUB	200	U.S. Army (Signal Corps)	1,091
Fort Hayes	Ghio	WVZ	250	U.S. Army	1,412
Fort H.G. Wright ..	New York State 41° 15' 20" N. 72° 01' 12" W.	WUC	200	U.S. Army (Signal Corps)	1,100

UNITED STATES OF
AMERICA—*contd.*

Fort Howard ..	Maryland	WVQ	250	U.S. Army	1,349
Fort Huachuca ..	Arizona	WZP	—	U.S. Army (Signal Corps)	1,318
Fort Leavenworth ..	Kansas 39° 21' 00" N. 94° 55' 31" W.	WUD	1,000	—	952, 2,855
Fort Levett ..	Maine 43° 38' 40" N. 70° 11' 39" W.	WUE	200	U.S. Army (Signal Corps)	1,300
Fort McArthur ..	California	WUCK	300	—	1,304
Fort McIntosh ..	Texas 27° 30' 29" N. 99° 31' 02" W.	WUH	300-1,000	—	1,364
Fort McKinley ..	Oregon	WUCV	—	—	—
Fort McPherson ..	Georgia	WVR	500	U.S. Army, War Dept.	1,319, 2,552
Fort Monroe ..	Virginia 37° 00' 06" N. 76° 18' 24" W.	WUF	200	U.S. Army (Signal Corps)	674
Fort Morgan WIO ..	Alabama 32° 00' 00" N. 87° 00' 00" W.	WIO	100	Tropical Radio Telegraph Co., 131, State St., Boston (Mass.)	300, 450, 600, 1,700 spark
Fort Morgan WUR	Alabama, Mobile Bay	WUR	50	U.S. Army (Signal Corps)	1,090
Fort Moultrie ..	South Carolina	WZF	50	U.S. Army (Signal Corps)	1,090
Fort Omaha ..	Nebraska	WVU	250	U.S. Army	1,334
Fort Riley ..	Kansas 39° 04' 35" N. 96° 47' 01" W.	WUI	25	U.S. Army (Signal Corps)	1,091
Fort Ringgold ..	Texas	WZI	100	U.S. Army	1,091
Fort Rodman ..	Massachusetts	WUCN	50	—	600
Fort Rosecrans ..	California	WUS	200	U.S. Army (Signal Corps)	1,090
Fort Sam Houston ..	Texas 29° 26' 39" N. 98° 27' 44" W.	WUJ	2,000	U.S. Army (Signal Corps)	5,200
Fort San Jacinto ..	Texas 29° 19' 49" N. 94° 45' 28" W.	WUY	50	U.S. Army (Signal Corps)	825
Fort Screven ..	Georgia 32° 06' 34" N. 80° 50' 37" W.	WZA	50	U.S. Army (Signal Corps)	825
Fort Sill ..	Oklahoma	WUBD	1,000	U.S. War Dept. (Signal Corps)	1,537
Fort Stevens NZS D.F.	Oregon 46° 11' 32" N. 123° 59' 15" W.	NZS	150	U.S. Navy	375
Fort Stevens WUK	Oregon, Mouth of Columbia River	WUK	200	U.S. Army (Signal Corps)	1,091
Fort Storey ..	Virginia	—	50	—	1,100
Fort Terry ..	New York State	—	50	U.S. Army	1,100
Fort Totten ..	New York 40° 47' 38" N. 73° 47' 00" W.	WUL	200	U.S. Army (Signal Corps)	1,091
Fort Travis ..	Texas 29° 21' 51" N. 94° 45' 31" W.	WXP	30	U.S. Army (Signal Corps)	825
Fort Washington ..	Maryland 39° 00' 00" N. 77° 00' 00" W.	WXG	50	U.S. Army (Signal Corps)	825, 1,200
Fort Whitman ..	Washington	WZC	300	U.S. Army (Signal Corps)	1,091
Fort Williams ..	Maine	WUCU	25	—	475, 525, 600, 825
Fort Winfield Scott	California 37° 47' 36" N. 122° 28' 30" W.	WUO	300	U.S. Army	1,091
Fort Worden ..	Washington	WUN	200	U.S. Army (Signal Corps)	1,091

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Fourth Cliff D.F.	Massachusetts 42° 09' 40" N. 70° 42' 22" W.	NAD	150	U.S. Navy	375
Frackville	Pennsylvania 40° 46' 50" N. 76° 15' 06" W.	WBI	100	—	1,650
Frankfort	Michigan 44° 37' 46" N. 86° 14' 17" W.	WFK	150	Ann Arbor Railway Company	300, 600, 1,666
Fresno (T)	California 36° 43' 00" N. 119° 49' 00" W.	KDNU	125	—	425
Galveston	Texas 29° 18' 54" N. 94° 46' 52" W.	NKB	150	U.S. Navy	600, 975, 1,817
Gloucester D.F.	Massachusetts 42° 35' 19" N. 70° 41' 08" W.	NAD	150	U.S. Navy	375
Governors Island	New York State	WVP	200	U.S. Army	1,334
Grand Marais D.F.	Michigan 46° 40' 29" N. 85° 58' 25.97" W.	NZT	100	U.S. Navy	375
Great Lakes	Illinois 42° 18' 30" N. 87° 50' 00" W.	NAJ	300-1,000	U.S. Navy	600, 1,988, 3,400, 3,800, 3,950, 4,650 1,621
Guntersville	Alabama 34° 25' 00" N. 86° 20' 00" W.	WKH	300	—	—
Harrisburg T	Pennsylvania 40° 16' 00" N. 76° 55' 00" W.	WBAK	200	Pennsylvania State Police	400 c.w.
Hauto	Pennsylvania 40° 50' 40" N. 75° 54' 00" W.	WDS	100	Pennsylvania Light and Power Company	1,650
Hazleton	Pennsylvania 40° 57' 30" N. 75° 59' 04" W.	WCJ	100	Pennsylvania Light and Power Company	1,650
Hempstead	New York State	—	—	—	3,407, 3,998 c.w.
Hillsboro KEK	Oregon	KEK	—	—	—
Hillsboro KGH	Oregon 45° 31' 00" N. 122° 59' 00" W.	KGH	500	Federal Telegraph Co.	300, 600, 1,800
Hog Island D.F.	Virginia 37° 22' 36" N. 75° 42' 37" W.	NCZ	150	U.S. Navy	375
Houston	Texas 29° 43' 00" N. 95° 0' 00" W.	WFO	250	—	300, 450, 600
Imperial Beach D.F.	S. Diego, California 32° 35' 14" N. 117° 07' 54" W.	NPL	150	U.S. Navy	375
Indian Head	Maryland 38° 38' 00" N. 77° 10' 55" W.	NBG	100	U.S. Navy	365
Inglewood	California 34° 03' 05" N. 118° 14' 32" W.	NPX	850	U.S. Navy	365, 600, 975, 1,851, 2,400, 2,750, 3,950, 4,525
Iowa City	Iowa	KDTS	—	Post Office	3,369, 3,998
Jackson (T)	Ohio 39° 10' 00" N. 82° 40' 00" W.	WJQ	100	—	1,831 c.w.
Jefferson Barracks	Missouri	WVV	250	War Dept.	1,395
Johnswood	Michigan 45° 50' 00" N. 83° 40' 00" W.	KUVQ	200	—	300, 450, 600
Jordon	Montana 47° 20' 00" N. 106° 50' 00" W.	KUVR	—	—	500
Jupiter NAQ	Florida 26° 56' 54" N. 80° 05' 02" W.	NAQ	300	U.S. Navy	600, 975, 1,305

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Jupiter NAQ D.F. ..	Florida 26° 56' 59" N. 80° 04' 57" W.	NAQ	150	U.S. Navy	375
Kelly Field	Texas	WYG	250	U.S. Army	1,500
Key West NAR	Florida 24° 33' 22" N. 81° 48' 21" W.	NAR	300, 1,000	U.S. Navy	600, 975, 1,451, 1,500, 2,250, 2,400, spk. 3,950 5,700 c.w.
Key West NAR ² D.F.	Florida 24° 33' 08" N. 81° 45' 18" W.	NAR	150	U.S. Navy	375
Key West WUBV ..	24° 30' 00" N. 81° 48' 00" W.	WUBV	50	—	800
Lakehurst NEL ..	New Jersey 40° 02' 15" N. 74° 20' 13" W.	NEL	200	U.S. Navy	507
Lakehurst NEL ² D.F.	New Jersey 40° 02' 15" N. 74° 20' 13" W.	NEL	100	—	375
Langin Field ..	West Virginia	WYI	300	—	1,500
Langley Field ..	Virginia	WYC	250	U.S. Army	1,500
Laramie	Wyoming	WWD	—	—	—
Lawrenceville (T) ..	Illinois 38° 42' 37" N. 87° 41' 15" W.	WJB	300	Indian Pipe Line Cor- poration	1,790 c.w.
Light Vessel No. 44	North East End, N.J. 38° 37' 00" N. 74° 29' 00" W.	NARS	100	Dept. of Commerce ..	600
Light Vessel No. 48	Cornfield Point, Conn. 41° 13' 00" N. 72° 23' 00" W.	NASC	100	Dept. of Commerce ..	600
Light Vessel No. 52	Fenwick Island Shoal, Del. 33° 26' 00" N. 74° 46' 00" W.	NAJS	100	Dept. of Commerce ..	600
Light Vessel No. 54	Boston, Mass. 42° 20' 22" N. 70° 45' 26" W.	NADX	100	Dept. of Commerce ..	600
Light Vessel No. 67	Umatilla Reef, Wash. 48° 09' 00" N. 124° 51' 00" W.	NACV	100	Dept. of Commerce ..	600
Light Vessel No. 68	Fire Island, N.J. 40° 28' 40" N. 73° 11' 26" W.	NLS	100	Dept. of Commerce ..	600
Light Vessel No. 70	San Francisco, Cal. 37° 45' 03" N. 122° 41' 20" W.	NAKS	100	Dept. of Commerce ..	600
Light Vessel No. 72	Diamond Shoals, N.C. 35° 05' 08" N. 75° 18' 38" W.	NITQ	100	Dept. of Commerce ..	600
Light Vessel No. 73	Pollock Rip Shoal, Mass. 41° 36' 00" N. 69° 53' 00" W.	NAFT	—	Dept. of Commerce ..	300, 378, 476, 600, 756, 952
Light Vessel No. 79	Five Fathom Bank, N.J. 38° 47' 00" N. 74° 34' 00" W.	NADV	125	Dept. of Commerce ..	600
Light Vessel No. 80	Cape Lookout, Shoals, N.C. 34° 18' 00" N. 74° 24' 00" W.	NABV	100	Dept. of Commerce ..	600
Light Vessel No. 81	Heald Bank, Texas 29° 06' 05" N. 94° 13' 27" W.	NLP	100	Dept. of Commerce ..	600
Light Vessel No. 83	Blunts Reef, Cal. 40° 36' 04" N. 124° 30' 14" W.	NACT	150	Dept. of Commerce ..	600

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Light Vessel No. 84	Brunswick, Georgia 31° 00' 00" N. 81° 09' 35" W.	NABX	125	Dept. of Commerce ..	600
Light Vessel No. 85	Nantucket Shoals, Mass. 40° 37' 02" N. 69° 37' 06" W.	NLA	150	Dept. of Commerce ..	600
Light Vessel No. 87	Ambrose Channel, N.Y. 40° 36' 20" N. 74° 03' 05" W.	NALS	100	Dept. of Commerce ..	600
Light Vessel No. 88	Columbia Oregon 46° 10' 42" N. 124° 10' 36" W.	NAJT	100	Dept. of Commerce ..	600 1,000
Light Vessel No. 91	Winter Quarter Shoals, Va 37° 55' 00" N. 74° 56' 00" W.	NADT	100	Dept. of Commerce ..	600
Light Vessel No. 93	Swift Sure Bank Washington 48° 31' 00" N. 125° 00' 00" W.	NABT	100	Dept. of Commerce ..	600
Light Vessel No. 94	Frying Pan Shoals, N.C. 33° 33' 30" N. 76° 48' 20" W.	NLC	100	Dept. of Commerce ..	600
Light Vessel No. 101	Cape Charles Va. 37° 05' 00" N. 75° 43' 00" W.	NAJV	100	Dept. of Commerce ..	600
Lima T	Ohio 40° 45' 20" N. 84° 06' 40" W.	WBY	200	—	1,689
Long Beach T ..	California 33° 46' 12" N. 118° 11' 17" W.	KUNT	50	Pacific Telegraph and Telephone Co.	300, 350, 400, 450, 500, 600
Los Angeles T ..	California	KFR	100	Air Line Transporta- tion Co.	300, 525, 600
Los Angeles KHI (T)	California 34° 09' 00" N. 118° 11' 00" W.	KHI	200	Southern California Edison Company	300, 600, 1,764
Los Angeles KPK (T)	California	KPK	150	—	143
Los Angeles KVT T	California	KVT	150	Boulevard Express ..	300, 600, 1,599 c.w.
Los Angeles KWH (T)	California	KWH	150	—	360, 485, 540
Ludington	Michigan 43° 56' 47" N. 86° 26' 19" W.	WLD	300	Pere Marquette Rail- way Co.	300, 450, 600, 1,666
Madison WHA ..	Wisconsin 43° 04' 30" N. 89° 23' 45" W.	WHA	200	—	1,290
Manasquan D.F. ..	New Jersey 40° 07' 05" N. 74° 01' 58" W.	NAH	150	U.S. Navy	375
Manitowoc	Wisconsin 44° 07' 00" N. 87° 45' 00" W.	WMW	300	Pere Marquette Rail- way Company	300, 600, 1,666
Marion WCC .. (see note 1)	Massachusetts 41° 42' 45" N. 70° 46' 30" W.	WCC	1,000	Radio Corporation of America, New York	300, 600, 2,000
Marion WRQ ..	Massachusetts 41° 42' 45" N. 70° 46' 30" W.	WRQ	4,000	Radio Corporation of America	13,900 c.w.
Marion WSO ..	Massachusetts	WSO	—	Radio Corporation of America	11,620
Marshfield	Oregon 43° 20' 38" N. 124° 13' 33" W.	NPF	300	U.S. Navy	600, 975, 1,946
Martinsville T ..	Illinois 39° 20' 30" N. 87° 54' 06" W.	WHY	200	—	1,689

UNITED STATES OF
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Maxwell	Alabama	WYK	250	—	1,500
Maywood	Illinois	KDQA	—	—	3,569, 3,998
Medicine Bow Peak	Wyoming	WWD	—	—	—
Memphis	Tennessee 35° 09' 00" N. 90° 03' 00" W.	WYDB	500	Inland and Coastwise Waterways Service, War Dept.	600, 756, 952, 1,200, 1,500, 1,900
Miami	Florida 80° 07' 15" N. 25° 48' 21" W.	WAX	500	Tropical Radio Tele- graph Co., 131, State St., Boston (Mass.)	300, 450, 600, 706, 1,599
Miles City	Montana 46° 24' 22" N. 105° 49' 31" W.	KUXN	200	—	500
Minneapolis WLB T	Minnesota 44° 58' 21" N. 93° 14' 13" W.	WLB	600	—	360, 410, 485
Minneapolis WLP T	Minnesota 44° 59' 00" N. 93° 18' 00" W.	WLP	100	—	1,764
Mitchell Field ..	New York	WYA	250	U.S. Army	1,500
Mobile	Alabama 30° 41' 34" . 88° 02' 27"	WNN	150	—	—
Morehead City ..	North Carolina 34° 43' 30" N. 76° 44' 00" W.	NAN	150	U.S. Navy	600, 975, 1,634
Negley T	Ohio 40° 47' 48" N. 80° 34' 54" W.	WCQ	200	—	1,689
Newark WJZ (T) ..	New Jersey 40° 44' 00" N. 74° 10' 00" W.	WJZ	300	—	300, 360, 600
Newark WWU ..	New Jersey	WWU	—	Post Office	300, 600, 3,100
New Brunswick WII	New Jersey	WII	4,000	Radio Corporation of America	13,600
New Brunswick WRT	New Jersey 40° 30' 10" N. 74° 29' 15" W.	WRT	4,000	—	11,500 c.w.
New Dungeness D.F.	Washington 48° 10' 36" N. 123° 07' 51" W.	NFT	100	U.S. Navy	375
New London ..	Connecticut 41° 18' 01" N. 72° 05' 02" W.	WST	200	Independent Wireless Telegraph Co., New York	300, 450, 600
New Orleans NAT ..	Louisiana 29° 56' 51" N. 90° 01' 54" W.	NAT	300-1,000	U.S. Navy	600, 975, 2,400, 2,600, spk. 3950, 6,300 c.w.
New Orleans WNU	Louisiana	WNU	1,500	Tropical Radio Tele- graph Company	300, 600, 1,700, 2,850 c.w. and spark
New Orleans WYDC	Louisiana	WYDC	500	Inland and Coastwise Waterways Service War Dept.	600, 1,832
Newport	Rhode Island 41° 35' 20" N. 71° 17' 00" W.	NAF	300	U.S. Navy	150, 600, 975, 2,600
New York KUVS ..	New York	KUVS	300	Police	300, 450, 600
New York NAH ..	New York State 40° 41' 58" N. 73° 58' 48" W.	NAH	300	U.S. Navy	150, 600, 975, 1,540, 2,400 spark
New York WBC ..	New York 40° 40' 15" N. 73° 20' 31" W.	WBC	200-500	Independent Wireless Telegraph Company	300, 600, 1,800 spark and arc
New York WCG ..	New York 40° 42' 45" N. 74° 00' 23" W.	WCG	300	Independent Wireless Telegraph Company	300, 500, 600
New York WHI ..	New York 40° 43' 50" N. 73° 59' 31" W.	WHI	200	John Wanamaker ..	300, 600, 1,700
New York WNY ..	New York 40° 39' 30" N. 74° 00' 05" W.	WNY	200-300	Radio Corporation of America	300, 600, 1,800 2,000 spk. and c.w.

UNITED STATES OF AMERICA—contd.					
Norfolk	Virginia 36° 49' 36" N. 76° 17' 43" W.	NAM	300-1,000	U.S. Navy	150, 600, 975, 1,300, 2,400, 3,000, 507, 600, 1,395 2,400 3,000 5,450 c.w.
North Head	Washington 46° 17' 56" N. 124° 04' 31" W.	NPE	500	—	600, 975, 2,720, 4,525, 5,000
North Island D.F. ..	South Carolina 33° 13' 18" N. 79° 11' 10" W.	NZW	100	U.S. Navy	375
North Platte	Nebraska	KDHM	—	Post Office	3,486, 3,998
North Truro D.F. ..	Massachusetts 42° 02' 23" N. 70° 03' 37" W.	NAE	150	U.S. Navy	375
Northville (T)	Michigan 42° 20' 00" N. 83° 29' 00" W.	KDEP	50	—	1,909
Oakland	California	KGA	—	—	143
Ocean Park D.F. ..	Washington 46° 27' 53" N. 124° 03' 16" W.	NZS	150	U.S. Navy	375
Omaha	Nebraska	KDEF	—	—	3,224, 3,998
Orange T	Texas 30° 10' 00" N. 95° 10' 10" W.	WBAR	100	—	1,625 c.w.
	Illinois 41° 43' 47" N. 87° 44' 15" W.	WJC	200	—	1,790
	Illinois 39° 07' 30" W.	KWT	—	Federal Telegraph Co.	3,554, 3,900, 4,300, 4,785, 5,720, 7,587 365, 600
	South Carolina 32° 21' 01" N. 80° 40' 22" W.	NAV	100	U.S. Navy	
	California 33° 20' 15" N. 115° 11' 4" W.	KUXV	50	—	300, 350, 400, 450, 500, 600, c.w.
	California 35° 00' 40" N. 115° 30' 40" W.	NAS	150	U.S. Navy	375
	California 35° 10' 54" W. 87° 10' 54" W.	NAS	300	U.S. Navy	507, 600, 975 1,330 1,330
Philadelphia NAI ..	Pennsylvania 39° 53' 20" N. 75° 10' 50" W.	NAI	300	U.S. Navy	600, 975, 1,300
Philadelphia WGL (T)	Pennsylvania 39° 57' 00" N. 75° 08' 00" W.	WGL	50, 300	—	250 & c.w. 360
Philadelphia WHE	Pennsylvania 39° 57' 06" N. 75° 09' 44" W.	WHE	100	John Wanamaker ..	300, 600, 1,700
Pine Bluff (T.)	Arkansas	WOK	50	Pine Bluff Co. ..	360, 510
Pittsburgh	Pennsylvania	WWY	150	—	Variable
Point Arroyo D.F. ..	California 34° 34' 43" N. 120° 38' 51" W.	NPK	150	Government	375
P	California 41° 19' N. 117° 36" W.	NPX	150	U.S. Navy	375
	California 38° 13' N. 117° 30" W.	NMD	100	U.S. Navy	75
	California 32° 42' 11" N. 117° 15' 17" W.	NPL	150	U.S. Navy	375
Point Montara D.F.	California 37° 32' 02" N. 122° 31' 07" W.	NLH	150	U.S. Navy	375
Point Reyes KDU ..	California 37° 54' 30" N. 122° 40' 45" W.	KDU	4,000	Radio Corporation of America	13,100

UNITED STATES OF
AMERICA—contd.

Pont Reyes NLG D.F.	San Francisco Entrance, California 38° 02' 13" N. 122° 59' 36" W.	NLG	150	U.S. Navy	375
Port Arthur	Texas	WKI	400	D. M. Picton & Co. ..	300, 600
Port Eads NBX D.F.	Louisiana 29° 00' 43" N. 89° 09' 32" W.	NBX	—	U.S. Navy	800
Port Eads WZH ..	Louisiana	WZH	200	U.S. Army (Signal Corps)	600, 1,100
Port Hiron (T) ..	Michigan 42° 47' 33" N. 82° 25' 33" W.	KDPJ	150	Radio Corporation of America	1,621
Portland NAB ..	Maine 43° 33' 54" N. 70° 12' 08" W.	NAB	300	U.S. Navy	300, 600, 800
Portland NAB ..	43° 33' 58" N. 70° 12' 00" W.	NAB	100	—	600, 1,620
Portsmouth	New Hampshire 43° 04' 33" N. 70° 44' 00" W.	NAC	300	U.S. Navy	600, 975, 1,395
Poyners Hill D.F. ..	North Carolina 36° 17' 16" N. 75° 47' 48" W.	NCZ	150	U.S. Navy	375
Prices Neck D.F. ..	Rhode Island 41° 27' 04" N. 71° 20' 16" W.	NAF	150	U.S. Navy	375
Princeton (T) ..	Indiana 38° 17' 00" N. 87° 29' 00" W.	WJAV	200	—	1,790
Puget Sound	Washington 47° 41' 46" N. 122° 37' 03" W.	NPC	300-2,000	U.S. Navy	600, 975, 1,463 1,988 S.K. 3,950, 5,450, 7,100, 7,000 7,900 C.W.
Pysht (T.)	Washington 48° 12' 00" N. 124° 07' 00" W.	KJA	25	Merill & Ring Lumber Co.	146
Quantico	Virginia 38° 49' 00" N. 77° 30' 00" W.	NFV	150	U.S. Navy	507, 600
Quincy (T)	Massachusetts 42° 14' 16" N. 70° 58' 39" W.	KDGU	200	—	1,966
Rainbow	Montana 47° 35' 00" N. 111° 10' 00" W.	KLQ	200	—	550, 1,700
Raleigh (T)	North Carolina 35° 47' 35" N. 78° 39' 45" W.	WLAC	300	—	360, 500
Relief NACD	—	NACD	—	—	—
Relief NADB	—	NADB	—	—	—
Relief NAJC	—	NAJC	—	—	300, 600
Relief NITR	—	NITR	—	—	300, 378, 476, 600, 756, 952
Relief NITS	—	NITS	—	—	300, 378, 476, 600, 756, 952
Reno	Nevada	KDEK	150	Post Office	3,784, 3,998
Rock Springs. ..	Wyoming	KDHN	—	Post Office	3,156, 3,998
Rockwell Field ..	California	WYH	250	U.S. Army	1,500
Rogers (T)	Michigan 45° 25' 00" N. 83° 50' 00" W.	WHT	500	Michigan Limestone & Chemical Co. ..	300, 450, 600, 1,764
Salt Lake City ..	Utah	KDEH	—	Post Office	3,258, 3,998
San Diego KVV(T)..	California	KVV	150	—	300, 600, 1,599 C.W.

UNITED STATES OF AMERICA—cont'd.

San Diego NPL ..	California 32° 42' 26" N. 117° 14' 49" W.	NPL	300, 3,000	U.S. Navy	600, 975, 1,538 2,400, spk 3,950, 5,200, 9,801 c.w.
Sandy Hook D.F. ...	New Jersey 40° 27' 54" N. 73° 59' 50" W.	NAH	150	U.S. Navy	375
San Francisco KDQC	California	KDQC	—	—	—
San Francisco KEB	California	KEB	200	Marine Exchange ..	300, 550, 600
San Francisco KFS..	California 37° 49' 36" N. 122° 30' 06" W.	KFS	500	Federal Telegraph Co.	300, 600, 1,800
San Francisco KHH (T)	California	KHH	150	—	300, 570, 600
San Francisco KII ..	California	KII	—	—	—
San Francisco KPH	California 37° 54' 12" N. 122° 42' 30" W.	KPH	300	Radio Corporation of America, Woolworth Building, New York (N.Y.)	13,315
San Francisco KTA (T)	California	KTA	200	—	143, 300, 600 c.w.
San Francisco KUO T	California	KUO	150	—	143, 300, 600, 690
San Francisco NPG..	California 37° 05' 03" N. 122° 15' 57" W.	NPG	300, 2,500	U.S. Navy	150, 601, 975 1,330, 2,400, 2,725 spk. 2,900, 3,950, 4,650, 4,800, 7,900, 10,500, c.w. 17,145 1,349
San Francisco WVY	California 118° 05' 05" W.	WVY	500	War Department ..	150
San Pedro	California 33° 57' 48" N. 118° 22' 35" W.	NPX	300, 600	U.S. Navy	300, 450, 600
San Ysidro	California 32° 34' 40" N. 117° 05' 06" W.	KFN	150	—	600, 1,806
Savannah	Georgia 32° 05' 15" N. 81° 06' 15" W.	NEV	150	U.S. Navy	—
Schenectady	New York State	WWS	—	—	—
Scott Field	Illinois (Belle- ville)	WYF	50	U.S. Army	952
Seattle KPE	Washington 47° 37' 00" N. 122° 20' 00" W.	KPE	300	City of Seattle Harbor Dept.	300, 550, 600, 1,641 1,800
Seattle KVV	Washington 47° 37' 00" N. 122° 20' 00" W.	KVV	200	Light Dept., Seattle (Washington)	300, 425, 500, 600 c.w.
Selfridge Field ..	Michigan (Mount Clemens)	WYE	250	Government	1,500
Shock T.	Kentucky	WAAI	150	Sullivan Pond Creek Co.	1,610 c.w.
Siasconset NBS ..	Massachusetts, Nantucket Islds. 41° 15' 50" N. 69° 58' 19" W.	NBS	150	U.S. Navy	300, 600
Siasconset WSC ..	Massachusetts 41° 16' 35" N. 69° 58' 10" W.	WSC	300	Radio Corporation of America	300, 600, 1,610
Skagit Power Site (T)	Washington 48° 40' 00" N. 121° 15' 00" W.	WJE	150	—	300, 425, 500, 600 c.w.
Smith Island D.F. ..	Washington 48° 19' 04" N. 122° 50' 39" W.	NFH	100	U.S. Navy	375
South Pass D.F. ..	Louisiana 29° 00' 43" N. 89° 09' 32" W.	NBX	150	U.S. Navy	375
Springfield (T) ..	Massachusetts 42° 08' 30" N. 72° 33' 08" W.	WBZ	200	Westinghouse Electric Manufacturing Co.	400, 1,817

UNITED STATES OF
AMERICA—contd.

Springfield (T.) ..	Ohio	WNA	200	—	1,875 c.w.
Stanford University T.	California 37° 25' 35" N. 122° 10' 12" W.	KFGH	150	—	1,290
St. Augustine ..	North-East Coast of Florida 29° 53' 10" N. 81° 17' 18" W.	NAP	300	U.S. Navy	600, 975, 2,100
St. Croix Falls T. ..	Wisconsin 45° 40' 00" N. 92° 40' 00" W.	WPL	100	—	1,764
St. James	New York 40° 55' 45" N. 72° 56' 30" W.	WQK	4,000	Radio Corporation of America	16,465
S. Louis WYDA ..	Missouri 38° 38' 00" N. 90° 15' 00" W.	WYDA	500	Inland and Coastwise Waterways Service War Department	600, 756, 952, 1,200, 1,500, 1,900 1,625
Superior T. ..	Michigan 42° 15' 44" N. 83° 38' 27" W.	KDPI	40	—	1,625
Surfside D.F. ..	Nantucket, Mass. 41° 14' 39" N. 70° 05' 53" W.	NBS	150	U.S. Navy	375
Tampa	Florida 27° 58' 00" N. 82° 27' 00" W.	WPD	300	George C. Warner, Jr.	300, 450, 600
Tatoosh NPD ..	Washington 43° 23' 31" N. 124° 44' 03" W.	NPD	450	U.S. Navy	975, 1,654
Tatoosh NPD D.F. . .	Washington 48° 23' 41" N. 124° 44' 13" W.	NPD	150	U.S. Navy	375
Thompson Falls ..	Montana	KLL	—	—	550, 1,700
Tralce T.	West Virginia 37° 34' 00" N. 81° 24' 00" W.	WCAA	150	—	525 c.w.
Tuckerton	New Jersey 39° 33' 00" N. 74° 23' 00" W.	WGG	4,000	Radio Corporation of America	15,900
Tullahoma	Tennessee 35° 23' 00" N. 86° 15' 00" W.	WJJ	300	—	1,621
Tulsa (T.)	Oklahoma 35° 20' 00" N. 96° 00' 00" W.	WEH	150	—	360, 485 1,599 c.w.
Tybee Island D.F. . .	Georgia 32° 00' 58" N. 80° 50' 27" W.	NEV	100	U.S. Navy	375
Urbana (T.) . . .	Illinois 40° 07' 00" N. 88° 15' 00" W.	WRM	100	—	360, 410 c.w.
Virginia Beach NAM	Virginia 36° 50' 26" N. 75° 58' 58" W.	NAM	135	U.S. Navy	507
Virginia Beach NCZ D.F.	Virginia 36° 51' 10" N. 75° 58' 33" W.	NCZ	150	U.S. Navy	375
Washington NAA ..	District of Columbia 38° 52' 05" N. 77° 04' 47" W.	NAA	1,000, 1,500	U.S. Navy	2,650, 3,950 5,950
Washington NAL ..	District of Columbia 38° 52' 22" N. 76° 59' 46" W.	NAL	300, 1,000	U.S. Navy	2,650, 5,950
Washington NDD ..	District of Columbia 40° 44' 36" N. 73° 06' 12" W.	NDD	3,000	U.S. Navy	10,510
Washington NKF ..	District of Columbia	NKF	—	—	—
Washington NSS .. (Annapolis)	District of Columbia, Chesapeake Bay 38° 59' 25" N. 76° 27' 00" W.	NSS	5,000	U.S. Navy	17,145

UNITED STATES OF AMERICA—cont'd.

Washington WWX	District of Columbia	WWX	—	—	3,656, 3,998
Washington WXY ..	District of Columbia	WXY	—	U.S. Army	1,338, 2,998 (variable)
West Memphis ..	Arkansas	WYCJ	200	U.S. Navy	300, 600, 700
West Point	New York State	WUAH	25	—	1,091
West Port Arthur ..	Texas	WPA	300	Gulf Refining Co., West 7th Street, Port Arthur (Texas)	300, 600
Whitefish Point D.F.	Michigan	NZT	100	U.S. Navy	375
Wilmington	California	KSE	300	Radio Corporation of America, Woolworth Building, New York (N.Y.)	300, 450, 600
ALASKA (u)					
Afognak	58° 06' 00" N. 152° 48' 00" W.	WWT	150	—	—
Akutan	Aleutian Islands	KMW	150	—	300, 600, 1,600
Alitak	Kodiak Island	KYL	150	Alaska Packers' Association	300, 500, 600
Anchorage	Alaska	WUP	—	—	—
Anvik (T)	62° 39' 00" N. 160° 12' 00" W. Appx.	KKP	50	John W. Chapman (Bureau of Foreign and Domestic Missions Church P.E.)	300, 450, 600
Becharof	58° 16' 00" N. 157° 23' 00" W.	KUDV	200	—	300, 500, 600
Bethel	60° 48' 00" N. 161° 45' 00" W.	WVI	—	Government	430, 480, 530, 600
Candle (T)	65° 55' 00" N. 161° 58' 00" W.	KGF	25	U.S. Navy	300, 550, 600
Cape Hinchinbrook, D.F.	60° 14' 00" N. 146° 38' 54" W.	NRM	150	U.S. Navy	375
Carlisle	59° 02' 00" N. 156° 48' 00" W.	KOV	300	Carlisle Packing Co., L. C. Smith Building, Seattle (Wash.)	550, 600, 1,650
Chichagof	57° 39' 35" N. 136° 05' 40" W.	KRX	200	Chichagof Mining Co.	300, 550, 600
Chignik KHC ..	Alaska Peninsula	KHC	300	Alaska Packers' Association	300, 500, 600, 1,600
Chignik KNP ..	56° 17' 30" N. 158° 31' 30" W.	KNP	300	Columbia River Packers' Association	300, 525, 600, 1,650
Chisik Island ..	56° 17' 00" N. 158° 23' 00" W.	KUCP	300	—	300, 550, 600, 1,650
Chomly	60° 10' 00" N. 152° 25' 00" W.	KDP	150	—	300, 550, 600
Circle	55° 15' 00" N. 132° 20' 00" W.	WVA	500	—	1,350, 1,700, 2,200
Clark's Point ..	65° 49' 12" N. 144° 04' 18" W.	KHG	200	—	300, 400, 500, 600
Cordova	Bristol Bay	NPA	300-2,000	U.S. Navy..	600, 975, 2,400, 2,700, 3,950, 5,950, 7,100, 7,500 C.W.
Craig	58° 50' 45" N. 158° 31' 30" W.	WXO	200	U.S. Navy	600
Daly	60° 28' 30" N. 145° 25' 30" W.	KDJT	150	—	300, 550, 600
Dutch Harbor ..	55° 25' 00" N. 133° 15' 00" W.	NPR	300	U.S. Navy.	600, 975, 2,255
Egegik	58° 59' 00" N. 158° 32' 30" W.	KMF	300	—	300, 500, 600
Ekuk	Aleutian Islands, Unalaska	KMG	300	—	300, 500, 600

ALASKA—contd.

Fairbanks	64° 50' 17" N. 147° 42' 21" W.	WVB	500	U.S. Signal Corps ..	2,000, 2,600, 3,200, 3,700, 4,100, 4,700, 5,000 arc
False Pass	55° 08' 00" N. 162° 55' 00" W.	KJL	200	P. E. Harris & Co. ..	300, 525, 600 , 1,650
Fort Egbert	Eagle 64° 46' 19" N. 141° 13' 48" W.	WVC	100	U.S. Army	550, 575, 600, 630
Fort Gibbon	Tanana 65° 10' 16" N. 152° 05' 21" W.	WVD	1,000	U.S. Signal Corps ..	1,100, 1,275, 1,875, 2,200 spark
Fort Yukon	66° 30' 00" N. 145° 40' 00" W.	WXX	200	—	600, 1,000 spark
Funter	57° 00' 00" N. 135° 00' 00" W.	KXK	—	—	300, 550, 600
Hawk Inlet	58° 05' 00" N. 131° 45' 00" W.	KKAI	150	—	300, 550, 600
Hidden Inlet	54° 56' 40" N. 130° 20' 02" W.	KQL	300	—	300, 450, 600
Holy Cross	Alaska 62° 10' 00" N. 160° 00' 00" W.	WVK	300	U.S. Army	450, 510, 525, 550
Hot Springs	64° 55' 10" N. 150° 58' 15" W.	WXK	100	—	425, 440, 560, 620
Hyder	55° 40' 00" N. 130° 10' 00" W.	KDFA	300	Hyder Townsite and Improvement Co.	300, 600 , 1,610
Iditarod	62° 40' 00" N. 158° 00' 00" W.	WXL	100	—	425, 510, 580, 600
Ikatan	54° 45' 00" N. 163° 30' 00" W.	KXW	100	—	550, 600
Juneau	58° 18' 35" N. 134° 24' 45" W.	NVD	450	North Pacific Sea Products Co., L. C. Smith Bldg., Seattle (Wash.)	600, 975 , 2,250
Kanatak	57° 42' 00" N. 157° 39' 30" W.	KGC	300	—	300, 525, 600 , 1,625
Karluk	Kodiak Island 57° 35' 30" N. 154° 25' 00" W.	KYK	25	Alaska Packers' Asso- ciation	300, 500, 600
Katalla	60° 10' 00" N. 144° 30' 00" W.	KSC	150	Chilkat Oil Company	300, 600 , 1,650
Ketchikan	Alexander Archipelago 55° 20' 45" N. 131° 38' 51" W.	NVH	300-1,000	U.S. Navy	600, 975 , 1,870, 2,400, 4,525, 5,000
King Cove	Alaska Peninsula 55° 05' 00" N. 162° 20' 00" W.	KJK	250	Pacific American Fisheries, Belling- ham (Alaska)	300, 600 , 1,610
Kodiak	Hood Island, near the Town of Kodiak 57° 46' 45" N. 152° 21' 45" W.	NPS	500	U.S. Navy	600, 975 , 1,688
Koggiung KUBX ..	Bristol Bay 58° 45' 00" N. 156° 42' 00" W.	KUBX	20	Alaska Packers' Asso- ciation	300, 400, 600
Koggiung KVV (see note u) ..	Bristol Bay 58° 52' 30" N. 156° 55' 30" W.	KVV	300	Libby, McNeill & Libby	300, 450, 600 , 1,600
Kukak Bay	58° 20' 00" N. 154° 05' 00" W.	KDN	150	—	300, 550, 600
Kussilof	Appx. Cook Inlet 60° 20' 00" N. 151° 22' 00" W.	KKAO	200	Alaska Packers' Asso- ciation	525, 600 , 1,610
Kwichak	59° 03' 00" N. 156° 48' 00" W.	KHIB	200	—	300, 400, 500, 600
Latouche	60° 00' 00" N. 148° 00' 00" W.	KIM	300	Kennecott Copper Corporation	300, 600, 1,650
Lazy Bay	56° 58' 00" N. 154° 05' 00" W.	KEPS	130	Alitak Packing Co. ..	300, 600 , 1,650
Libbyville	59° 00' 00" N. 158° 30' 00" W.	KMT	300	Libby, McNeill & Libby	300, 600 , 1,700, 2,000
Livengood	65° 36' 54" N. 148° 32' 18" W.	WUV	300	U.S. Army	520

ALASKA—contd.

Lockanok	59° 05' 45" N. 156° 37' 50" W.	KML	300	Libby, McNeill & Libby	300, 500, 600
Lost Harbor	54° 15' 00" N. 165° 35' 00" W.	KWS	200	—	300, 550, 600
McGrath	—	WXV	100	U.S. Army	450, 500, 550, 600
Metha Nelson	Bristol Bay 58° 45' 00" N. 158° 28' 00" W.	KMP	25	Alaska Packers' Association	300, 400, 600
Naknek KHT	Bristol Bay 58° 43' 30" N. 157° 00' 00" W.	KHT	300	Alaska Packers' Association	300, 500, 600 , 1,610
Naknek KMK	Bristol Bay 58° 43' 20" N. 156° 25' 00" W.	KMK	500	Naknek Packing Co.	300, 500, 600 , 1,800
Nelson Lagoon	55° 55' 00" N. 160° 50' 00" W.	KXV	100	Pacific American Fisheries	550, 600
Noone	Norton Sound 64° 30' 20" N. 165° 23' 33" W.	WVG	500	U.S. Signal Corps, Seattle (Wash.) ..	510, 550, 575, 600 , 3,000, 3,500, 4,000, 5,000 spark, arc & c.w.
Noorvik	65° 40' 00" N. 160° 40' 00" W.	WVM	100	U.S. Army	425, 475, 520, 550, 600
Nulato	64° 43' 30" N. 158° 06' 48" W.	WVH	100	U.S. Army	6, 5, 660, 730, 760
Nushagak	59° 00' 00" N. 158° 30' 00" W.	KKAE	300	—	300, 600 , 1,600
Pearl Creek Dome	Cold Bay Oil District. 57° 42' 00" N. 156° 04' 00" W.	KFU	300	—	450 1,700
Pilot Point	57° 33' 00" N. 157° 36' 00" W.	KUDT	200	Alaska Packers Association	300, 500, 600
Pirate Cove	55° 21' 50" N. 160° 21' 40" W.	KOXN	500	Union Fish Company	300, 600 , 1,650
Port Althorp	58° 08' 00" N. 136° 15' 00" W.	KLW	300	—	300, 550, 600
Port Beauchaire	56° 18' 00" N. 133° 54' 00" W.	KWO	300	Beauchaire Packing Co.	300, 550, 600
Port Moller	55° 50' 00" N. 160° 40' 00" W.	KWR	250	Pacific-American Fisheries, Bellingham (Alaska)	300, 450, 600 , 1,610
Port Walter	56° 20' 00" N. 134° 40' 00" W.	KEQ	100	Alaska Herring and Sardine Co.	300, 500, 600
Pybus Bay	57° 20' 00" N. 134° 00' 00" W.	KFC	150	—	300, 550, 600
Quadra	55° 06' 00" N. 130° 48' 00" W.	KHD	150	—	300, 550, 600
Radioville	57° 36' 30" N. 136° 09' 20" W.	KWW	200	Joseph T. Bauner ..	300, 550, 600
Rose Inlet	54° 57' 00" N. 132° 59' 00" W.	KJC	150	—	300, 555, 600
Ruby KDRH	58° 50' 00" N. 157° 02' 00" W.	KDRH	15	—	300, 400, 600
Ruby WVF	64° 42' 20" N. 155° 30' 25" W.	WVF	100	—	325, 450, 520, 600
Saltchuck	55° 35' 00" N. 132° 30' 00" W.	KWQ	100	Saltchuck Mining Co.	300, 550, 600
Seldovia	59° 50' 00" N. 152° 00' 00" W.	KEA	300	Adam Lipke	300, 550 600
Seward	60° 07' 00" N. 149° 24' 00" W.	NPV	200	U.S. Navy	600, 1,908
Sitka	57° 02' 57" N. 135° 21' 00" W.	NPB	500, 1,000	U.S. Navy	600 , 975, 2,400, 2,650, 3,950, 4,800
Suag Point	Alexander Archipelago 59° 02' 30" N. 158° 27' 15" W.	KHF	200	Alaska Packers Association	300, 400, 500, 600
Soapstone Point D.F.	58° 06' 13" N. 136° 29' 51" W.	NUW	150	U.S. Navy	375
S. George	Pribilof Islands 56° 36' 00" N. 169° 43' 00" W.	NPY	100	U.S. Navy	600 , 675

ALASKA—*cont'd.*

S. Michael ..	63° 40' 00" N. 162° 10' 00" W.	WVE	100	U.S. Signal Corps, Seattle (Wash.)	450, 525, 550, 600
S. Paul ..	Pribilof Islands 57° 07' 20" N. 170° 16' 20" W.	NPQ	300, 1,500	U.S. Navy ..	600, 975, 2,650, 3,950, 5,700
Tee Harbor ..	58° 26' 00" N. 134° 45' 00" W.	KQP	150	—	300, 550, 800
Tenakee ..	57° 52' 00" N. 135° 00' 00" W.	KOSC	200	—	300, 550, 600
Ugashik ..	57° 34' 28" N. 157° 35' 00" W.	KMU	200	—	300, 500, 600
Unga ..	55° 20' 45" N. 160° 38' 39" W.	KVI	300	Alaska Codfish Co. ..	300, 600, 1,800
Union Bay ..	55° 47' 22" N. 132° 11' 38" W.	KON	300	—	300, 450, 600, 1,800
Uyak.. (see note u)	Kodiak Island 57° 37' 30" N. 153° 59' 40" W.	KHA	300	Alaska Packers Association	300, 500, 600, 1,610
Valdez ..	61° 06' 00" N. 146° 17' 00" W.	WXJ	25	—	1,000, 1,100, 1,200, 1,500
Warren ..	58° 42' 00" N. 156° 56' 00" W.	KDJU	150	—	300, 550, 600, 1,610
Yakutat ..	59° 34' 00" N. 139° 46' 00" W.	KKA	500	Libby, McNeill and Libby	300, 550, 600
Yes Bay ..	55° 55' 00" N. 131° 48' 00" W.	KRU	150	—	300, 500, 600

URUGUAY

English Bank ¹ ..	To the South- East of Montevideo 35° 06' 30" S. 35° 53' 30" W.	CWC	100	Government ..	450, 600
Cerrito ..	Near Montevideo 34° 51' 20" S. 56° 10' 10" W.	CWA	1,000	Government ..	600, 1,000, 1,250 spk. 1,800 c.w.,
Isla de Lobos ¹ ..	35° 01' 39" S. 54° 53' 01" W.	CWB	100	Government ..	450, 600
Rocha ..	34° 30' 12" S. 54° 20' 10" W.	CWR	200	—	600-1,000 spk.

VENEZUELA

Barquisimeto ..	10° 03' 57" N. 68° 18' 45" W.	AYH	400	—	1,650, 2,400, 3,200, 3,600, 4,400 c.w.
Caracas (T.)..	10° 30' 24" N. 66° 55' 45.45" W.	AYA	300	—	300, 600, 825, 925, 1,125, 1,450, 1,650, 1,950 c.w.
Guaira (La) ..	10° 36' 49" N. 66° 56' 45" W.	AYG	400	—	300, 600, 1,200, 1,650, 2,400, 3,200 spk.
Maracay (T.) ..	10° 15' 37" N. 67° 36' 45" W.	AYB	300	—	600, 825, 925, 1,125, 1,450, 1,650, 1,950 c.w.
Maracaybo ..	10° 38' 32" N. 71° 36' 30" W.	AYF	300	—	300, 600, 1,200, 1,650, 2,400, 3,200 c.w.
Porlamar ..	Isla de Margarita 10° 56' 51" N. 63° 51' 13.5" W.	AYE	200	—	300, 600, 900, 1,650 spk.
Puerto Cabello (T.) ..	10° 29' 42" N. 68° 00' 30" W.	AYC	300	—	300, 600, 825, 925, 1,125, 1,450, 1,650, 1,950 c.w.,
S. Cristobal ..	07° 46' 11" N. 72° 14' 30" W.	AYD	400	—	1,650, 2,400, 3,200, 3,600, 4,400 c.w.

VIRGIN ISLANDS

S. Croix ..	West Indies 17° 45' 07" N. 64° 42' 16" W.	NNI	100	U.S. Navy ..	450, 600
S. Thomas ..	18° 20' 23" N. 64° 55' 52" W.	NBB	150	U.S. Navy ..	600, 975, 1,685 spk.

WINDWARD PASSAGE (See under BRITISH WEST INDIES)					
YUGO-SLAVIA (See SERBS, CROATS and SLOVENES (Kingdom of)) (see note v)					
ZANZIBAR					
Pemba	05° 14' 20" S. 39° 46' 06" E.	VQE	85	Government	300, 600 2,000
Zanzibar	06° 09' 58" S. 39° 11' 29" E.	VPZ	300	—	300, 600 2,000

NOTES

- (a) *Willis Islets Station*: Only open during the cyclone season, December to April.
- (b) *Jesselton, Kudat, Sandakan and Tawao* are mainly employed in inland service but listen for ships, on 600 metres, at 0800, 1100, 1300, 1500, and 1700, Hong-Kong time.
- (c) *Clarke City, Fame Point, Father Point and Montreal* only open during season of navigation, approximately April to December.
- (d) *Guantanamo NAW* transmits weather reports during the hurricane season (June 1st to November 1st), only.
- (e) *Moengo* only transmits correspondence of the *Surinaamsche Bauxite Co.*, and of the Government of *Paramaribo and Albina*.
- (f) *Rochefort-Sur-Mer* calls and replies to ships on 600 metre wavelength in the first instance, but afterwards exchanges traffic on 300 metres. *Dieppe* communicates only with cross-channel steamers between *Newhaven* and *Dieppe*, and with *Dieppe* trawlers.
- (g) Public correspondence with *Lightships* restricted to urgent messages relating to navigation. *Sassnitz* station; public correspondence with ferry boats of the *Sassnitz-Tralleborg Line*. Official correspondence with *Tralleborg* and the ferry boats.
- (h) *Andover, Calshot, Castle Bromwich, Cranwell, Croydon, Didsbury, Guernsey G.E.Y., Henlow, Isle of Grain, Lee-on-Solent, Lerwick, Leuchars, Lympne, Netheravon, Old Sarum, Pulham, Renfrew, Shotwick, Spittlegate, and Uxbridge*, for Aircraft Service only.
- Clifden*: Public correspondence with ships restricted to transmission of radiotelegrams to ships incapable of C.W. reception when they are out of range of other British spark coast stations.
- (i) *Isthmus of Corinth* station is used in connection with the passage of ships through the *Isthmus*.
- (j) The call sign *PCF* applies to any or all the Aerodromes of the Royal Marine; it is followed, when necessary, by the name or number of a particular aerodrome.
- (k) *Ancona IQW, Leghorn, Saseno, Spezia and Taranto* are purely Military stations. *Rome ICD* and *IDO* used for special service, the latter transmits meteorological reports twice daily. When *Messina* is occupied with Military or State correspondence, ships North of the Straits of *Messina* should communicate with *Palermo, Naples, or C. Sperone*, those South of the Straits with *Vittoria or Cotrone*.
- (l) *Horonushiro* is connected with the telegraph system through the *Ochishi* coast station and is open approximately from 1st May to 30th September. *Komoto, Mohuko, Shogetsubito* and *Shosito* are lighthouses whose traffic is limited to intercommunication with each other and with the *Kosai Maru* belonging to the Chosen Government and Japanese warships.
- Minamitogurijima* corresponds only with Japanese stations.
- (m) *Ventspils* is used principally for official correspondence, but will accept public correspondence destined for *Ventspils* if, for any reason, other Latvian coast stations do not reply.
- (n) *Port of France*, being primarily a Naval station, only admits general public correspondence if there is no official correspondence.
- (o) *Rabaul* transmits on 2,500 metres only during daylight when required.
- (p) Stations in *Labrador* are only open from July to October.
- (q) *Constanta-Tunnel*: Public correspondence limited to certain specified ships.
- (r) The small stations at *Cadiz and Matagorda*, only transmit the correspondence of the *Cie. Trans atlantique Espagnole*.
Los Alcazares, Cuatro Vientos, Getafe, Madrid ECLB and Seville for Aircraft Services only.
- (s) *Boden and Harnosand* stations are closed when navigation is suspended in the Gulf of *Bothnia* on account of ice.
- Grundkallen and Olandsrev* Lightships transmit to the coast messages received by means of flag signals from vessels passing within sight or re-transmit to such vessels messages received from coast stations.
- (t) *Marion, Mass. WCC* is distantly controlled from *Chatham, Mass.*
- (u) The stations at *Chignik KHC, Kvichak, Nahnek, Snag Point and Uyak* are open only from April to October; *Koggiung KVV* from July 1st to August 20th.
- (v) *Hersegnovi and Sibenik* are purely Military stations.

AIRCRAFT STATIONS.

Name	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.
FRANCE					
A.T.10 ¹	FAIB	100	—	600, 800	P G
A.T.12 ¹	FAIC	100	—	600, 800	P G
A.T.14 ¹	FAID	100	—	600, 800	P G
A.T.15 ¹	FAIL	100	—	600, 800	P G
A.T.19 ¹	FAIQ	100	—	600, 800	P G
A.T. 24	FAIU	—	—	—	—
C.M.2	FAKD	—	—	—	—
Mediterranée ¹	FADDM	150	—	600, 900	P G
V.Z.2 ¹	FAKC	100	—	600, 800	P G
V.Z.3 ¹	FAKH	100	—	600, 800	P G
V.Z.4 ¹	FAKJ	100	—	600, 800	P G
V.Z.5 ¹	FAKM	100	—	600, 800	P G
V.Z.8 ¹	FAKP	100	—	600, 800	P G
V.Z.10 ¹	FAKQ	100	—	600, 800	P G
V.Z.11 ¹	FAKS	100	—	600, 800	P G
V.Z.12 ¹	FAKT	100	—	600, 800	P G
V.Z.14 ¹	FAKU	100	—	600, 800	P G
V.Z.17 ¹	FAKY	100	—	600, 800	P G
V.Z.24	FAKZ	—	—	—	—
Z.D.2 ¹	FAJD	100	—	600, 800	P G
Z.D.3 ¹	FAJN	100	—	600, 800	P G
GREAT BRITAIN					
GEA ⁴	GEA ⁴	—	—	—	—
GEAAB (T)	GEAAB	—	—	— ²	— ¹
GEAPJ (T)	GEAPJ	—	—	— ²	— ³
GEASI (T)	GEASI	—	Instone	— ²	— ³
GEATH (T)	GEATH	—	Handley Page	— ²	— ³
GEAWW (T)	GEAWW	—	—	— ²	— ³
GEAWY (T)	GEAWY	—	—	— ²	— ³
GEBBG (T)	GEBBG	—	Handley Page	— ²	— ³
GEBBH (T)	GEBBH	—	Handley Page	— ²	— ³

GREAT BRITAIN—contd.

GEBBI (T)	.. ..	GEBBI	—	Handley Page	— 2	— 3
GEBBL (T)	.. ..	GEBBL	—	Instone	— 2	— 3
GEBBQ (T)	.. ..	GEBBQ	—	—	— 2	— 3
GEBBR (T)	.. ..	GEBBR	—	Instone	— 2	— 3
GEB S (T)	.. ..	GEBBS	—	—	— 2	— 3
GEBBT (T)	.. ..	GEBBT	—	Instone	— 2	— 3
GEBBV (T)	.. ..	GEBBV	—	Instone	— 2	— 3
GEBBW (T)	.. ..	GEBBW	—	Instone	— 2	— 3
GEBBY (T)	GEBBY	—	Daimler	— 2	— 3
GEBCX (T)	GEBCX	—	Daimler	— 2	— 3

HOLLAND

Vliegtuigen	PBP ⁵	—	Navy	—	—
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ITALY

Ange'o Berardi	IXAAA	—	Ministry of War	600	—
F.6	ISAAG	—	Minister of Commerce and Industry	600	—
M.1	.. ..	ISAAE	—	Minister of Commerce and Industry	600	—
M.6	.. ..	IZAAC	—	Inspectorate of the Royal Naval Air Service	600	—
M.14	.. ..	ISAAF	—	Minister of Commerce and Industry	600	—
M.18	.. ..	IZAAB	—	Inspectorate of the Royal Naval Air Service	600	—
O.8..	.. ..	ISAAH	—	Minister of Commerce and Industry	600	—
P.V.3	.. ..	IZAAD	—	Inspectorate of the Royal Naval Air Service	600	—

UNITED STATES OF AMERICA

Balboa T	.. ..	KFBA	100	Aeromarine Airways Inc.), 1800 Times Building, New York (N.Y.)	300, 525, 600	P
Buckeye (T)	.. ..	KFBY	100	Aeromarine Airways (Inc.), 1800 Times Building, New York (N.Y.)	525	P
Shenandoah	.. ..	NERK	—	—	—	O
ZR.3	.. ..	NERM	—	—	—	O

*Notes :*¹ Dirigible balloon of the French Navy.² 900,600. (Radiotelegraphy on a wavelength of 600 metres is used only in cases of distress.)³ Correspondence restricted to messages respecting safety or navigation of the aircraft.⁴ The general call-sign GEA denotes any aircraft of the British Royal Air Force.⁵ This call-sign applies to any or all of the aeroplanes of the Dutch Royal Navy.

It is followed when necessary by the letter or number of a particular aeroplane.

INTERNATIONAL CALL LETTERS

Allotted to Countries of the World under the Radio Telegraphic Convention.

The International Bureau has allotted to signatories of the Convention a list of combinations of letters to be used as call signals for stations proper to the respective countries. The letter limitations of these lists are given in this section, together with the names of countries with which they are connected.

AAA to AMZ	Germany.	OAA to OBZ	Peru.
ANA to APZ	Netherland Indies.	OCA to OFZ	Great Britain.
AQA to AWZ	Norway.	OGA to OIZ	Denmark.
AXA to AXZ	Poland.	OJA to OJZ	Finland.
AYA to AYZ	Venezuela.	OKA to OKZ	Czecho Slovakia.
AZA to AZZ		OLA to OMZ	Holland.
B	Great Britain.	ONA to OTZ	Belgium and Colonies.
CAA to CEZ	Chili.	OUA to OZZ	Denmark.
CFA to CKZ	British Possessions and Protectorate.	PAA to PIZ	Holland. (Home).
CLA to CMZ	Spain.	PJA to PJM	Curacao.
CNA to CNZ	Morocco.	PJN to PJZ	Surinam.
COA to COZ	Great Britain.	PKA to PMZ	Netherland Indies.
CPA to CPZ	Bolivia.	PNA to PPZ	Brazil.
CQA to COZ	Monaco.	PQA to PSZ	Portugal.
CRA to CRZ	Portuguese Colonies.	PTA to PVZ	Brazil.
CSA to CUZ	Portugal.	PWA to PWZ	Cuba.
CVA to CVZ	Roumania.	PXA to PZZ	Holland. (Home).
CWA to CWZ	Uruguay.	Q	Reserved for abbreviations.
CXA to CXZ	Spain.	RAA to RQZ	Russia.
CYA to CZZ	Mexico.	RRA to RZZ	
DAA to DSZ	Germany.	SAA to SMZ	Sweden.
DTA to DTZ	Danzig (Free Town of).	SNA to STZ	Brazil.
DUA to DZZ	Germany.	SUA to SUZ	Egypt.
EAA to EHZ	Spain and Colonies.	SVA to SZZ	Greece.
EIA to EZZ	Great Britain.	TAA to TEZ	Turkey.
F	French Colonies and Protectorates.	TFA to TFZ	Ireland.
G	Great Britain.	TGA to THZ	Greece.
HAA to HAZ	Hungary.	TIA to TOZ	Spain.
HBA to HBZ	Switzerland.	TPA to TUZ	Norway.
HCA to HCZ	Ecuador.	TVA to TZZ	Holland.
HDA to HEZ	Holland.	UAA to UMZ	France and Colonies and Protectorates.
HFA to HFZ	Serbs, Croates and Slovenes (Kingdom of).	UNA to UNZ	Serbs, Croates and Slovenes (Kingdom of).
HGA to HHZ	Siam.	UOA to UOZ	Austria.
HIA to HIZ	Dominican Republic.	UPA to UZZ	Italy.
HJA to HKZ	Columbia (Republic of)	VAA to VGZ	Canada.
HLA to HNU	Spain.	VHA to VKZ	Australian Commonwealth.
HNV to HNZ	New Hebrides.	VLA to VMZ	New Zealand.
HOA to HZZ	France and Colonies and Protectorates.	VNA to VNZ	Union of South Africa.
I	Italy and Colonies.	VOA to VOZ	Newfoundland.
J	Japan and Colonies.	VPA to VSZ	British Colonies and Protectorates without autonomous Government
KAA to KAY	Germany.	VT A to VWZ	British Indies and Persian Gulf.
KAZ	Danzig (Free Town of).	VXA to VZZ	British Colonies and Pro- tectorates.
KBA to KBZ	Germany.	W	U.S.A.
KCA to KCZ	Lettonia (Latvia).	XAA to XDZ	Mexico.
KDA to KZZ	U.S.A.	XEA to XMZ	Great Britain.
LAA to LHZ	Norway.	XNA to XSZ	China.
LIA to LRZ	Argentine Republic.	XTA to XZZ	Great Britain.
LSA to LUZ	Great Britain.	Y	Great Britain.
LVA to LVZ	Guatemala.	Z	Great Britain.
LWA to LWZ	Norway.		
LXA to LZZ	Bulgaria.		
M	Great Britain		
N	U.S.A.		

ALPHABETICAL LIST OF CALL SIGNS ALLOTTED TO LAND AND AIRCRAFT STATIONS OF THE WORLD

TABLE OF ABBREVIATIONS USED

(1) Against Name of Station

- T** = Radiotelephony only
(T) = Radiotelephony in addition to Radiotelegraphy.

(2) Under Nature of Service

- A** = Aviation.
B = Broadcast News, Concerts, etc.
Bea = Radio Beacon.
Cal = Calibration Waves.
DF = Direction Finding.
Dis = Distress Signals.
Exp = Experimental.
FX = Corresponds with fixed stations only.
Nav = Navigational Warnings.
O = Official Correspondence only (including Naval and Military Stations).
P = Private Station.
PG = General Public Correspondence.
PR = Restricted Public Correspondence.
Rec = Receiving only.
Sp = Special Service.
T = Time Signals.
W = Weather and Meteorological Reports.

An asterisk (*) indicates that these signals are only sent when necessary (*e.g.*, Gale Warnings), or upon request from ships or aircraft.

Notes—

- 1 = Station Temporarily Closed.
2 = Station under Construction or Projected.

For Particulars of Time Signals, Weather Reports, Navigational Warnings, Radio Beacons, and Calibration Waves refer to **SCIENTIFIC SIGNAL SECTION**.

ALPHABETICAL LIST OF CALL SIGNS.

LAND STATIONS

Call Sign.	Station.	Country.	Service.	Call Sign.	Station.	Country.	Service.
Abbeville	Abbeville Aerodrome	France	A FX W	BZF	Aden Radio	Br. Somld.	PR W
AD	Amsterdam AD ..	Holland	FX	BZG	Mauritius ..	Mauritius	Nav
Ajaccio	Ajaccio Aerodrome	Corsica	A FX W	BZL	Demerara ..	Br. Guiana	PG W
AKR	Akobo	Sudan ..	O	BZM	St. Johns ..	Newflnd.	PG
Antibes	Antibes Aerodrome	France	A FX W	BZQ	Christiania ¹ ..	Jamaica	O
ATR	Atbara	Sudan ..	O	BZR	Somerset Island ¹ ..	Bermuda	—
AXJ	Posen	Poland	FX				—
AXK	Grudziadz	Poland ..	FX	Casa- blanca	Casablanca Aerodrome	Morocco	A FX
			Press	Castle	Castle Bromwich Radio (T)	Gr. Brit.	A FX
AXL	Warsaw Rad. Cent.	Poland ..	O FX W	CCA	Arica	Chile ..	PG
AXO	Warsaw Rad. Cent.	Poland ..	O FX W	CCB	Antofagasta ..	Chile ..	PG
AYA	Caracas (T) ..	Venezuela	PG	CCC	Coquimbo ..	Chile ..	PG
AYB	Maracay (T)	Venezuela	FX	CCD	Juan Fernandez ..	Chile ..	PG
AYC	Puerto Cabello (T)	Venezuela	PG*	CCE	Valparaiso P. Ancha	Chile ..	PG
AYD	S. Christobal	Venezuela	FX	CCG	Santiago Moneda ..	Chile ..	O
AYE	Porlamar	Venezuela	PG*	CCH	Santiago University	Chile ..	Exp
AYF	Maracaybo ..	Venezuela	PG	CCI	Santiago Espejo ..	Chile ..	A
AYG	La Quayra ..	Venezuela	PG	CCK	Talcahuano Rocuant	Chile ..	PG
AYH	Barquisimeto ..	Venezuela	FX	CCL	Talcahuano Escuela de Torpedos	Chile ..	Control
AZA	Talinn	Esthonia	PG	CCN	La Mocha ..	Chile ..	PG
AZN	Narva	Esthonia	O	CCO	Llanquihue ..	Chile ..	FX
AZQ	Nekmangrund Lightship	Esthonia	PR	CCQ	Huafo	Chile ..	PG
AZR	Revalstein Lightship	Esthonia	PR	CCR	Rio Aysen ..	Chile ..	PR
AZS	Saritchev Lightship	Esthonia	PR	CCS	Raper	Chile ..	PG
AZU	Tartu	Esthonia	FX	CCV	Bories	Chile ..	PG
AZX	Reserve Lightship ..	Esthonia	PR	CCW	Punta Arenas ..	Chile ..	FX
BAV	Brussels	Belgium	B	CCX	Catalina		
BVG	Berwick DF ..	Gt. Brit.	DF	CCY	Punta Arenas ² Apostadero	Chile ..	PR
BVN	Flamborough DF ..	Gt. Brit.	DF	CCZ	Evangelistas ..	Chile ..	PR
BVY	Lizard DF ..	Gt. Brit.	DF	CGI	Felix ³	Chile ..	PR
BWK	Kingstown ..	Ireland	O	CGI	Willis Islets	Australia	PG
BWW	North Front ..	Gibraltar	O	Chasseur	C 91	France	A
BXC	Chatham Admiralty House	Gt. Brit.	O	CLM	Mahon CLM ..	Minorca	O
BXF	Famagusta ..	Cyprus ..	O	CLR	Madrid	Spain ..	O
BXH	Orfordness DF ..	Gt. Brit.	Exp.	CLZ	La Carraca ..	Spain	O
BXM	Chatham H.M.S. Hecla	Gt. Brit.	O	CNA	Agadir	Morocco	PG Nav ⁴
BXO	Dolphin Fort Blockhouse	Gt. Brit.	O	CNK	Kenitra-Gonio ..	Morocco	DF
BXW	Selectar	Singapore	O	CNO	Casablanca Aerodrome	Morocco	A FX
BXY	Stoncutters Island	Hong-Kg.	O	CNP	Casablanca Cheteba	Morocco	DF
BYA	Admiralty	Gt. Brit.	O	CNP	Casablanca Maroc	Morocco	PG DF
BYB	Cleethorpes Radio ..	Gt. Brit.	O	CNW	Tangier	Morocco	Nav
BYC	Horsea	Gt. Brit.	O	CNY	Mogador	Morocco	PG Nav
BYD	Aberdeen	Gt. Brit.	O	CPA	Ballivian	Bolivia	—
BYE	Ipswich	Gt. Brit.	O	CPB	D'Orbigny ..	Bolivia	—
BYF	Pembroke	Gt. Brit.	O	CPC	Yacuiba	Bolivia	—
BYH	Rosyth	Gt. Brit.	O	CPD	Esteros	Bolivia	—
BYK	Sheerness	Gt. Brit.	O	CPE	Riberalta	Bolivia	—
BYM	Culver Cliff ..	Gt. Brit.	O	CPF	Viacha	Bolivia	—
BYN	Portland Bill ..	Gt. Brit.	O	CPG	Cobija	Bolivia	—
BYO	Rame Head ..	Gt. Brit.	O	CPH	Villa Bella ..	Bolivia	—
BYQ	Corkbeg ¹ ..	Ireland	O	CPI	Trinidad ..	Bolivia	—
BYW	Rock	Gibraltar	PR	CPJ	S. Ana	Bolivia	—
BYY	S. Angelo ..	Malta	O W	CRA	Bissau	Port. Gea.	PG
BYZ	Rinella	Malta	O W	CRB	Bolama	Port. Gea.	PG
			Nav	CRCC	Buzi	Port. E.A.	PG
DZA	Inchkeith D.F. ..	Gt. Brit.	Exp	CRE	Dili	Timor	PG
BZB	Bermuda Dockyard	Bermuda	PG	CRF	S. Vicente de Cabo Verde	Cape Verde Islands	PG W
BZC	Portsmouth Signal School	Gt. Brit.	O				
BZE	Matara	Ceylon	O W				
			Nav				

CRFF	S. Filipe	C. Verde I.	PG	FED	Berre - Bouches -	France	O
CRI	Sal. Sta. Maria ..	C. Verde I.	PR W		du-Rhône		
CRJ	Boa Vista, Sal. Rei.	C. Verde I.	PR	FEG	Guipavas-Gonio ..	France	DF
CRK	Prafa	C. Verde I.	PG	FEI	Moulin-du-Seigneur	France	DF
CRL	Loanda	Angola	PG		Gonio		
CRLL	Huambo	Angola	FX	FEJ	Djidjelli-Gonio ..	Algeria	DF
CRLM	Malange	Angola	FX	FEM	La Mitre-Gonio ..	France	DF
CRLN	Lubango	Angola	FX	FEO	Ushant-Gonio ..	France	DF
CRLP	Camacupa	Angola	FX	FEP	Penmarch-Gonio ..	France	DF
CRLQ	S. Antonio de Zaire	Angola	FX	FEQ	Setié-Meriem Gonio	Tunis ..	DF
CRLS	Vila Henrique de	Angola	FX	FER	Pointe-du-Raz-Gonio	France	DF
	Carvalho			FES	Soubise-Gonio ..	France	DF
CRM	Mossamedes ..	Angola	PG	FET	Tréguier-St.-Gonery-	France	DF
CRN	Novo Redondo ..	Angola	PG		Gonio		
CRO	Lobito	Angola	PG	FEX	La Trinité-Gonio	France	DF
CRP	Ambriz	Angola	PR	FEZ	S. Nazarre-Ville-ès-	France	DF
Croydon	Croydon Radio (T)	Gt. Brit.	A FX		Martin-Gonio		
Croydon	Croydon DF ..	Gr. Brit.	DF	FFA	Alger T.S.F. ..	Algeria	PG W*
			(A only)				Nav.*
CRQ	Cabinda	Angola	PG	FFB	Boulogne-sur-Mer	France	PG W*
CRR	Baia dos Tigres ..	Angola	PR		T.S.F.		Nav*
CRS	S. Francisco, Macao	Macao ..	PR	FFC	Bonifacio T.S.F. ..	Corsica	PG W*
CRT	Beira	Portuguese	PG	FFD	Beyrouth TSF ..	Syria ..	PG
		E. Africa		FFH	Havre T.S.F.	France	PG W*
CRV	Mozambique ..	Portuguese	PG				Nav*
		E. Africa		FFI	Dieppe	France	PR
CRW	Quelimane ..	Portuguese	PG	FFM	Marseille T.S.F. ..	France	PG W*
		E. Africa		FFN	Nice T.S.F. ..	France	PR
CRY	Inhambane ..	Portuguese	PG	FFS	S. Maries de la Mer	France	PG W*
		E. Africa			T.S.F.		Nav*
CRZ	Lourenco Marques	Portuguese	PG T W	FFU	Ushant T.S.F. ..	France	PG W*
		E. Africa					Nav*
CTG	Cartagena	Columbia	PG	FFW	Bizerte-Setié-Meriem	Tunis ..	PG W*
CTV	Monsanto	Portugal	PG				Nav*
CVAZ	Constanta Tunnel	Roumania	PR	FFX	Bordeaux T.S.F. ..	France	PG W*
CWA	Cerrito	Uruguay	PG W				Nav
CWB	Isla de Lobos ..	Uruguay	—	FFZ	Shanghai-Zikawei	China ..	PG T W
CWC	English Bank (Banco	Uruguay	—	FL	Eiffel Tower (T) ..	France	PG B
	Ingles)						T Cal.
Didsbury	Didsbury Radio (T)	Gt. Brit.	A FX	FMA	Monrovia	Liberia	PG
EAA	Aranjuez	Spain ..	PG	FNB	Le Bourget (T) ..	France	A Cal
EAB	Barcelona Radio ..	Spain ..	PG	FNC	Nancy Aerodrome	France	FX W
EAC	Cádiz Radio	Spain ..	PG	FND	Dijon Aerodrome	France	FX W
EAF	Cabo Finisterre ..	Spain ..	PG Bea.	FNG	St. Inglevert (T) ..	France	A FX W
EAL	Las Palmas	Canary Is.	PG	FNI	Abbeville	France	A FX
EAO	Soller Radio	Majorca	PG		Aerodrome (T)		W
EAP	Cabo de Palos ..	Spain ..	PG	FNJ	Ajaccio	Corsica	A FX
EAS	Cabo Mayor	Spain ..	PG		Aerodrome (T) ..		W
EAT	Tenerife Radio ..	Canary Is.	PG	FNK	Antibes Aerodrome	France	A FX
EAV	Vigo ¹	Spain ..	PG		(T)		W
EAY	S. Isabel de Fernan-	Fern'do Po	O	FNL	Lyon Aerodrome ..	France	FX W
	do Pó			FNM	Marignane	France	FX W
EBW	Ferrol	Spain ..	O		Aerodrome		
EBX	Cartagena	Spain ..	O	FNN	Nîmes Aerodrome	France	FX W
EBY	S. Fernando Cadiz	Spain ..	O	FNP	Perpignan	France	FX W
EBZ	Madrid EBZ	Spain ..	FX		Aerodrome		
ECLA	Cuatro Vientos ..	Spain ..	A	FNQ	Montelimar	France	FX W
ECLB	Madrid-Direccion	Spain ..	A		Aerodrome		
	Aeronautica Militar			FNR	Romilly Aerodrome	France	FX W
ECLC	Getafe	Spain ..	A	FNS	Strasbourg	France	FX W
ECLD	Los Alcázares ..	Spain ..	A		Aerodrome		
ECLF	Seville	Spain ..	A	FNT	Toulouse	France	FX W
EGA	Almeira	Spain ..	O		Aerodrome		
EGB	Melilla	Morocco	O	FNV	Valenciennes	France	FX W
EGC	Madrid, EGC ..	Spain ..	O		Aerodrome		
EGD	Ceuta	Morocco	O	FNX	Bordeaux	France	FX W
EGE	Barcelona	Spain ..	O		Aerodrome		
EGF	Larache	Morocco	O	FNZ	Bayonne Aerodrome	France	FX W
EGG	Valencia	Spain ..	O				
EGH	Bilbao	Spain ..	O		French Aerodromes	France	A FX
EGI	Mahon, EGI ..	Minorca	O				Genera
EGJ	Coruña	Spain ..	O	FOO	Oran Aerodrome (T)	Algeria	A FX
EGK	Tetuán	Morocco	O	FSR	Fasher	Sudan ..	O
EGL	Cabo Juby	Morocco	O	FUA	Bizerte-Sidi-	Tunis	O
EGM	Málaga	Spain ..	O		Abdallah		
EGN	Villa Cisneros ..	Rio de Oro	O	FUC	Cherbourg-Gonio ..	France	DF
EGO	Alhucemas	Morocco	O		Cherbourg-Rouges-	France	PG W
EGZ	Guadalajara ..	Spain ..	O		Terres		Nav*
FEB	Bernières-Gonio ..	France	DF	FUD	Dunkerque-	France	PR W*
FEC	Agde DF	France	DF		Castelnau		Nav*

FUE	Mengam	France	PR	GLD	Lands End Radio	Gt. Brit.	PG W
FUF	S. Raphael	France	Nav*				Nav
FUG	Aubagne	France	O	GLO	Ongar Radio ..	Gt. Brit.	FX
FUH	Hourtin	France	O	GLP	Ongar Radio ..	Gt. Brit.	FX
FUI	Ajaccio-Aspretto ..	Corsica	O	GLV	Seaforth Radio ..	Gt. Brit.	PG Nav
FUK	Oran-ain-el-Turck	Algeria	PG W*	GMH	Malin Head Radio	Ireland..	W*
			Nav*				PG W
FUN	Lorient-Gonio ..	France	DF	GMR	Gambela	Sudan	O
FUN	Lorient-Pen-Mané	France	PG W*	GNF	North Foreland Rad.	Gt. Brit.	PG Nav
			Nav*				W*
FUO	Cuers-Pierrefeu ..	France	O	GNI	Niton Radio ..	Gt. Brit.	PG Nav
FUQ	Porquerolles ..	France	O Nav*				W*
FUR	Rochefort-sur-Mer	France	PR W*	GNJ	Fastnet	Ireland..	FX
			Nav*	GNR	Geneina	Sudan ..	O
FUT	Toulon-Mourillon	France	O	GNV	Newhaven Radio	Gt. Brit.	FX
FWA	Quang-Tcheou Wan	China ..	PG	GPK	Port Patrick Radio	Gt. Brit.	PG W*
GB	Glace Bay	Canada	FX				W*
GBL	Oxford Radio ..	Gt. Brit.	PR	GPQ	Parkeston Quay Rad	Gt. Brit.	P
GCA	Tobermory Radio ¹	Gt. Brit.	FX	GRL	Fishguard Radio ..	Gt. Brit.	PG W*
GCB	Lochboisdale Radio ¹	Gt. Brit.	FX				Nav*
GCC	Cullercoats Radio	Gr. Brit.	PG	GRN	Rathlin Is. Radio	Gt. Brit.	FX
			Nav*	GSL	Ballycastle Radio	Ireland..	FX
			W*	GSW	Stonehaven Radio	Gt. Brit.	FX
GCK	Valentia Radio ..	Ireland..	PG Nav	Guerns'y	Guernsey (T) ..	Gt. Brit.	A FX
			W*	GUR	Folkestone Harbour	Gt. Brit.	P
GCS	Caister-on-Sea Radio	Gt. Brit.	FX		Radio		
GDX	Isle of Man Radio ¹	Gt. Brit.	FX	GVA	Cross Sand Lightsh'p	Gt. Brit.	Dis.
GEC	Castle Bromwich	Gt. Brit.	A FX W	GVB	E. Goodwin L'tship	Gt. Brit.	Dis.
	Radio (T)			GVC	Gull Lightship ..	Gt. Brit.	Dis.
GED	Croydon Radio (T)	Gt. Brit.	A FX	GVD	S. Goodwin L'tship	Gt. Brit.	Dis.
GED	Croydon DF (T) ..	Gt. Brit.	DF A	GVE	Sunk Lightship ..	Gt. Brit.	Dis.
GEG	Lymône Radio (T)	Gt. Brit.	A FX	GVF	Tongue Lightship	Gt. Brit.	Dis.
GEK	Cologne	Germany	O	GXO	Crookhaven ..	Ireland..	FX
GEL	Lerwick Radio ..	Gt. Brit.	A FX				
GEM	Didsbury Radio (T)	Gt. Brit.	AFXW	HB	Csepel	Hungary	FX W
GEP	Pulham DF (T) ..	Gt. Brit.	DF A	HB 1	Genève-Cointrin (T)	Switz'l'd	A O B
GEP	Pulham Radio (T)	Gt. Brit.	A FXW	HB 2	Lausanne-Champ-	Switz'l'd	A O B
GER	Renfrew Radio (T)	Gt. Brit.	A FX		de-l'Air		
GEY	Guernsey (T) ..	Gt. Brit.	A FX	HBB	Berne	Switz'l'd	FX
GEZ	GEZ	Gt. Brit.	Gen.Call	HCE	Esmeraldas ..	Ecuador	PG
			for Brit.	HCG	Guayaquil ..	Ecuador	PG
			Aircraft	HCP	Puná, Guayas ..	Ecuador	PG
GFA	Air Ministry, L'nd'n	Gt. Brit.	A FX	HCQ	Quito	Ecuador	FX
			W Cal.	HFB	Belgrade	Ugo-Slavia	FX W
GFC	Cranwell	Gt. Brit.	A FX	HFC	Sarajevo	Ugo-Slavia	FX
GFD	Leuchars	Gt. Brit.	A FX	HFS	Skoplje	Ugo-Slavia	O
GFG	Isle of Grain ..	Gt. Brit.	A FX	HGA	Bangkok	Siam ..	PG
GFI	Duxford	Gt. Brit.	A FX	HGB	Singora	Siam ..	PG
GFI	Andover, Hants ..	Gt. Brit.	A FX	HGR	Red Lightship ..	Siam ..	PG
GFK	Donibristle ..	Gt. Brit.	O	HIB	La Romana ..	Dom. Rep.	PG
GFL	Calshot	Gt. Brit.	A FX	HJB	Puerto Colombia ..	Colombia	PG
GFM	Cattewater	Gt. Brit.	A FX	HJC	Baranquilla ² ..	Colombia	—
GFN	Bircham Newton ..	Gt. Brit.	A FX	HJD	Medellin ³	Colombia	—
GFO	Shotwick	Gt. Brit.	A FX	HJE	Cali ²	Colombia	—
GFP	Gosport, Hants ..	Gt. Brit.	A FX	HJF	Cacuta ³	Colombia	—
GFO	Farnborough ..	Gt. Brit.	A FX	HVA	Hanoi	Fr. Indo	PG W
GFR	Flowerdown ..	Gt. Brit.	A FX			China	
GFS	Spittlegate ..	Gt. Brit.	A FX	HVB	Kien-An	F.I.China	PGTNa
GFT	Old Sarum	Gt. Brit.	A FX	HVC	Cac-Ba	F.I.China	D.F.
GFU	Uxbridge, Midds'x	Gt. Brit.	A FX	HVD	Moncay	F.I.China	PG
GFW	Lee-on-the-Solent	Gt. Brit.	A FX	HVH	Fort Bayard ..	F.I.China	PG Nav
GFX	Netheravon	Gt. Brit.	A FX	HVI	Tourane	F.I.China	PG Nav
GFY	Henlow	Gt. Brit.	A FX	HVM	My-Tho	F.I.China	PGWNa
GGB	Aldershot	Gt. Brit.	FX	HVO	Poulo Condore ..	F.I.China	PG Nav
GGC	Riehl	Germany	FX	HVP	Phu-Quoc	F.I.China	PG Nav
GHA	Calafra	Malta	A FX	HVV	Noumea Semaphore	New Caledonia	PG W
GKA	Guernsey Radio ¹ ..	Chan. Isl	FX				
GKB	Northolt Radio ..	Gt. Brit.	FX	HVW	Port-Vila	New Hebrides	PG
GKD	Bar Lightship ..	Gt. Brit.	Bea				
GKG	Heysham Harbour	Gt. Brit.	P	HVY	Makatea	Fr. Oceanic	PG
	Radio			HVX	Papeete, Ile Tahiti	French Oceania	PG W
GKH	North Ronaldshay	Gt. Brit.	FX				
GKJ	Sanday	Gt. Brit.	FX	HWB	Dakar	French W Africa	PG
GKR	Wick Radio	Gt. Brit.	PG Nav				
			W*	HWC	Rufisque	F. W. Af.	PG
GKU	Devizes Radio ..	Gt. Brit.	PR W*	HWD	Conakry	F. W. Af.	PG
			Cal	HWF	Tabou	F. W. Af.	—
GKZ	Grimsby Radio ..	Gt. Brit.	PG W*	HWG	Grand Bassam ..	F. W. Af.	PG W
GLA	Ongar Radio	Gt. Brit.	FX	HWH	Cotonou	F. W. Af.	PG
GLB	Ongar Radio	Gt. Brit.	FX	HWI	Port Etienne ..	F. W. Af.	PG

HWZ	Douala	French Camer'ns	PG	ISO	Obbia	It. Somal.	PG
HYA	Djibouti	Fr. Somal.	PG	IZB	Fiume	Italy ..	FX
HYA	Rouen Port	France	P	JAA	Iwaki Radio	Japan ..	PG T
HYD	Diego-Suarez	M'dg'scar	PG. Nav	JCS	Choshi Radio	Japan ..	Nav.
HYE	Majunga	M'd 'scar	PG. Nav	JDA	Dairenwan	Japan ..	O PG
HYG	Mutsa nudu	M'dg'scar	PG	JFK	Keelung Radio	Japan ..	Nav
HYH	Dzaoudzi	M'd 'scar	PG	JHJ	Horomushiro Radio	Japan ..	PG Nav
HYI	M'Dé	M'dg'scar	PG	JJC	Funabashi Radio	Japan ..	PG
HYJ	Hellville	M'dg'scar	PG	JKM	Komonto (Lightho)	Japan ..	O T
HYS	S. Pierre	S. Pierre	FGW	JMP	Mokuho	Japan ..	O
HYT	Miquelon	Miquelon	FX	JMZ	Maizuru Radio	Japan ..	PG
HYU	Destrellan	Gu'd'loupe	PG	JN	Jan Mayen	Norway ..	W
HYV	Fort de France	Martinique	O PR	JOC	Otchishi Radio	Japan ..	PG
HYW	Cayenne	French Guiana	PG	JOS	Osezaki Radio	Japan ..	PG
HZL	Pointe Noire	French Congo	PG	JSA	Rasajima	Japan ..	PR
ICA	Aspio Radio	Italy ..	PG	JSB	Shogetsubito (Lt'ho)	Japan ..	Japanese stns. only
ICB	Genoa Radio	Italy ..	PG	JSM	Shiomisaki Radio	Japan ..	O
ICC	Coltano	Italy ..	FX	JSS	Shoseito (Lightho)	Japan ..	PG
ICD	Roma Centocelle	Italy ..	Sp	JSX	Shimotsui Radio	Japan ..	O
ICE	Brindisi Radio	Italy ..	—	JTS	Shimotsui Radio	Japan ..	PG
ICF	Messina Radio	Sicily ..	PG O*	JTW	Tsunoshima Radio	Japan ..	PG
ICG	Pantelleria	Italy (Isd.)	FX	JYU	Otomari Radio	Japan ..	PG
ICH	Maddalena Radio	Italy ..	PG	KAF	Minamioagarijima	Japan ..	Japanese stns. only
ICI	Guglielmo Marconi	Italy ..	FX	KAG	Amrum Bk Lightp	Germany ..	PR
ICJ	Bengazi Radio	Cyrenaica	PG	KAH	Adlergrund Lightp.	Germany ..	PR
ICK	Tripoli Radio	Tripolitana	PG O*	KAI	Heligoland	Germany ..	PG
ICL	Lampedusa	Italy ..	FX	KAJ	Norderney L'tship	Germany ..	PR
ICN	Naples Radio	Italy ..	PG O*	KAL	Eider Lightship	Germany ..	PR
ICO	Derna Radio	Cyrenaica	PG	KAN	List Lightship	Germany ..	PR
ICP	Palermo Radio	Sicily ..	PG	KAO	Wilhelmshaven 3rd Entrance Lightship	Germany ..	PR DF
ICQ	S. Cataldo di Bari	Italy ..	PG O*	KAP	List F.R.A.	Germany ..	DF
ICR	Capo Sperone Radio	Sardinia	PG	KAT	Pillau Lightship	Germany ..	PR
ICS	Spezia	Italy ..	O	KAU	Argast Leuchtturm	Germany ..	PR
ICT	Taranto	Italy ..	O	KAV	Assenjade Light'p	Germany ..	PR
ICU	Tobruch Radio	Cyrenaica	PG	KAW	Norddeich	Germany ..	PG
ICV	Vittoria Radio	Sicily ..	PG	KAY	Swinemünde	Germany ..	Nav W*
ICW	Rodi	Dodecanese	O PR	KAZ	Stolpmünde Lgtshp F.R.A.	Germany ..	PG
ICX	Massaua Rad. ICX	Eritrea ..	FX T	KBC	Danzig	Danzig ..	Nav W*
ICY	Assab Radio	Eritrea ..	PG	KBD	Fehmarnbelt Lightp	Germany ..	O DF
ICZ	Venice Radio	Italy ..	PG O*	KBE	Kalkgrund	Germany ..	PG W*
IDA	Stampalia	Dodecanese	—	KBF	Kalkgrund	Germany ..	PR
IDB	Saseno	Albania	O	KBH	Lightship	Germany ..	PR
IDD	Lipari	Italy (Isd.)	FX	KBI	Warnemünde Lightp	Germany ..	PR
IDE	Stromboli	Italy (Isd.)	—	KBK	Elbe Lightship Eins.	Germany ..	PR
IDH	Cotrone Radio	Italy ..	PG	KBL	Bremerhaven Lloyd-halle	Germany ..	PR
IDK	Leghorn	Italy ..	O	KBM	Kiel Lightship	Germany ..	PR
IDL	Civitavecchia Radio	Italy ..	PG	KBN	Kiel-Friedrichsort	Germany ..	PG
IDN	Cirene Radio	Cyrenaica	PG	KBO	Eiderlotsengaliote	Germany ..	PR
IDO	Roma San Paola	Italy ..	Sp W	KBQ	Borkum Lightship	Germany ..	PR
IDR	Tempio	Sardinia	PG O*	KBR	Nordholz Lightship	Germany ..	PR
IDS	Ustica	Italy (Isd)	FX	KBU	Borkum F.R.A.	Germany ..	DF
IFM	Messina	Sicily ..	FX	KBV	Nordholtz F.R.A.	Germany ..	DF
IFR	Reggio Calabria	Italy ..	FX	KBW	Borkum Riff Lightp	Germany ..	PR
IFV	Villa San Giovanni	Italy ..	FX	KBX	Stralsund Lightship	Germany ..	—
IQB	Fiume Radio	Fiume	PG	KBY	Sassnitz	Germany ..	PR
IQL	Smyrna Harbour	Smyrna (Italian)	O	KCA	Weser Lightship	Germany ..	PR
IQW	Ancona IQW	Italy ..	O	KCB	Cuxhaven	Germany ..	PG Nav
IQX	Trieste Radio	Italy ..	PG O*	KCC	Warnemünde F.R.A.	Germany ..	O DF
IQZ	Pola	Italy ..	PG O*	KCD	Riga	Latvia ..	PG W
IRG	Massaua Radio IRG	Eritrea ..	PG	KCE	Liepaja	Latvia ..	Nav
IRM	Murano DF	Italy ..	DF	KCH	Ventspils	Latvia ..	O PR
IRT	Mersa Fatma	Eritrea ..	FX	KDAH	Fairport	U.S.A. ..	FX
ISB	Merka	It. Somal.	PG	KDC	Casper (T)	U.S.A. ..	FX
ISC	Brava	It. Somal.	PG	KDEF	Omaha	U.S.A. ..	A
ISD	Gumbo	It. Somal.	PG	KDEG	Cheyenne	U.S.A. ..	A
ISE	Mogadiscio ISE	It. Somal.	PG	KDEH	S. Lake City	U.S.A. ..	A
ISF	Mahaddei Uea	It. Somal.	FX	KDEJ	Elko	U.S.A. ..	A
ISG	Mogadiscio I G	It. Somal.	Sp.T	KDEK	Reno	U.S.A. ..	A
ISH	Iscia Baidoa	It. Somal.	FX	KDEL	Brian	U.S.A. ..	—
ISI	Oddur	It. Somal.	FX	KDEN	Dearborn	U.S.A. ..	FX
ISJ	Bulo Burti	It. Somal.	FX				
ISM	Itala	It. Somal.	PG				
ISN	Bardera	It. Somal.	FX				
ISO	Lugh	It. Somal.	FX				
ISP	Haifun Dante Ali-ghieri Radio	It. Somal.	PG				

KDEP	Northville ..	U.S.A. ..	FX	KJC	Rose Inlet ..	Alaska ..	FX
KDFA	Hyder ..	Alaska ..	PG	KJK	King Cove ..	Alaska ..	PG
KDGU	Quincy ..	U.S.A. ..	FX	KJL	False Pass ..	Alaska ..	FX
KDHM	North Platte ..	U.S.A. ..	A	KKA	Yakutat ..	Alaska ..	FX
KDHN	Rock Springs ..	U.S.A. ..	A	KKAE	Mushagak ..	Alaska ..	FX
KDJT	Daly ..	Alaska ..	FX	KKAI	Hawk Inlet ..	Alaska ..	FX
KDJU	Warren ..	Alaska ..	FX	KKAO	Kussilof ..	Alaska ..	FX
KDKA	East Pittsburgh (T)	U.S.A. ..	FX B	KKP	Anvik (T) ..	Alaska ..	FX
KDN	Kukak Bay ..	Alaska ..	FX	KLL	Thompson Falls ..	U.S.A. ..	FX
KDNU	Fresno ..	U.S.A. ..	FX	KLQ	Rainbow ..	U.S.A. ..	FX
KDP	Chomly ..	Alaska ..	FX	KLW	Port Althorp ..	Alaska ..	FX
KDPH	Detroit, KDPH ..	U.S.A. ..	PR	KMF	Egekik ..	Alaska ..	FX
KDPI	Superior ..	U.S.A. ..	PR	KMG	Ekuk ..	Alaska ..	FX
KDPI	Port Huron ..	U.S.A. ..	PR	KMK	Naknek KMK ..	Alaska ..	FX
KDPM	Cleveland KDPM (T)	U.S.A. ..	FX B	KML	Lockanok ..	Alaska ..	FX
KDPS	Baytown ..	U.S.A. ..	PR	KMN	Butte ..	U.S.A. ..	FX
KDPU	Cascada ..	U.S.A. ..	FX	KMP	Metha Nelson ..	Alaska ..	FX
KDPV	Camp 60 ..	U.S.A. ..	FX	KMT	Libbyville ..	Alaska ..	PG
KDPW	Camp 61 ..	U.S.A. ..	FX	KMU	Ugashik ..	Alaska ..	FX
KDQA	Maywood ..	U.S.A. ..	A	KMW	Akutan ..	Alaska ..	FX
KDQC	S. Francisco KDQC	U.S.A. ..	O	KNP	Chignik, KNP ..	Alaska ..	FX
				KNR	Clearwater KNR ..	U.S.A. ..	FX
				KOG	Honolulu KOG ..	Hawaiian Islands	FX
KDRH	Ruby KDRH ..	Alaska ..	FX	KOK	Clearwater, KOK ..	U.S.A. ..	PG
KDTS	Iowa City ..	U.S.A. ..	—	KON	Union Bay ..	Alaska ..	PG
KDU	Point Reyes ..	U.S.A. ..	FX	KOSC	Tenakee ..	Alaska ..	PR
KEA	Seldovia ..	Alaska ..	PG	KOV	Carlisle ..	Alaska ..	PG
KEB	S. Francisco KEB	U.S.A. ..	P	KOXN	Pirate Cove ..	Alaska ..	PG
KED	Siasi ..	Phil. Is. ..	PG	KPB	Amuguis ..	Phil. Is. ..	PG
KEK	Hillsboro KEK ..	U.S.A. ..	PG	KPC	Batangas ..	Phil. Is. ..	PG
KEN	S. Diego KEN ..	U.S.A. ..	FX	KPE	Seattle KPE ..	U.S.A. ..	PG
KEO	Bongoa ..	Phil. Is. ..	PG	KPH	S. Francisco KPH	U.S.A. ..	PG
KEPS	Lazy Bay ..	Alaska ..	FX	KPI	Cebu ..	Phil. Is. ..	PG
KEQ	Port Walter ..	Alaska ..	PG	KPJ	Culion ..	Phil. Is. ..	PG
KET	Bolinas KET ..	U.S.A. ..	PR	KPK	Los Angeles KPK	U.S.A. ..	FX
KEV	Cagayan de Sulu ..	Phil. Is. ..	PG	KPM	Iloilo ..	Phil. Is. ..	PG
KEW	Balabac ..	Phil. Is. ..	PG	KPN	Isabela de Basilan	Phil. Is. ..	PG
KEY	Arroyo Pk. Cp. (T)	U.S.A. ..	FX	KPV	Malangas ..	Phil. Is. ..	PG
KFC	Pybus Bay ..	Alaska ..	FX	KPW	Malita ..	Phil. Is. ..	PG
KFGH	Stanford Univ. T.	U.S.A. ..	FX B	KPX	Lebak ..	Phil. Is. ..	PG
KFM	Camp 61 (C) ..	U.S.A. ..	FX	KPY	S. Francisco ..	Phil. Is. ..	PG
KFN	S. Ysidro ..	U.S.A. ..	FX	KPZ	Mati ..	Phil. Is. ..	PG
KFS	S. Francisco KFS	U.S.A. ..	PG				
KFT	Everett ..	U.S.A. ..	PG				
KFU	Pearl Creek Dome	Alaska ..	P				
KGA	Oakland ..	U.S.A. ..	P	KQL	Hidden Inlet ..	Alaska ..	PG
KGC	Kanatak ..	Alaska ..	FX	KQP	Tee Harbor ..	Alaska ..	FX
KGF	Candle (T) ..	Alaska ..	FX	KQT	S. Gabriel Camp (T)	U.S.A. ..	FX
KGH	Hill-boro' KGH ..	U.S.A. ..	FX	KRK	Cracow ..	Poland ..	FX
KGI	Kahuku KGI ..	Hawaiian Islands	PR	KRU	Yes Bay ..	Alaska ..	FX
				KRX	Chichagof ..	Alaska ..	PG
KHA	Uyak ..	Alaska ..	FX	KRY	Big Creek KRY (T)	U.S.A. ..	P
KHB	Kvichak ..	Alaska ..	FX	KSC	Katakla ..	Alaska ..	PG
KHC	Chignik KHC ..	Alaska ..	FX	KSE	Wilmington ..	U.S.A. ..	PG
KHD	Quadra ..	Alaska ..	FX	KTA	S. Francisco KTA (T)	U.S.A. ..	P
KHF	Snag Point ..	Alaska ..	FX	KUBX	Koggiung KUBX	Alaska ..	FX
KHG	Clark's Point ..	Alaska ..	FX	KUCP	Chisik Island ..	Alaska ..	FX
KHH	S. Francisco KHH	U.S.A. ..	FX	KUDT	Pilot Point ..	Alaska ..	FX
KHI	Los Angeles KHI	U.S.A. ..	PR	KUDV	Becharof ..	Alaska ..	FX
KHK	Wahiawa ..	Hawaiian Islands	PG	KUO	S. Francisco KUO (T)	U.S.A. ..	P
KHL	Wailuku ..	Hawaiian Islands	FX	KUVQ	Johnswood ..	U.S.A. ..	FX
				KUVR	Jordan ..	U.S.A. ..	FX
KHM	Lihue ..	Hawaiian Islands	FX	KUVS	New York, KUVS	U.S.A. ..	PR
				KUXM	Cheboygan ..	U.S.A. ..	FX
KHN	Kawaihae ..	Hawaiian Islands	FX	KUXN	Miles City ..	U.S.A. ..	FX
				KUXT	Long Beach ..	U.S.A. ..	FX
KHO	Kaukanakia ..	Hawaiian Islands	FX	KUXV	Pedrocitas (T) ..	U.S.A. ..	FX
				KVI	Unga ..	Alaska ..	FX
KHT	Naknek KHT ..	Alaska ..	FX	KVP	Big Creek KVP (T)	U.S.A. ..	P
KIE	Kahuku KIE ..	Hawaiian Islands	PR	KVT	Los Angeles KVT	U.S.A. ..	PR
				KVU	S. Diego KVU (T)	U.S.A. ..	FX
KIF	Davao ..	Phil. Is. ..	PG	KVV	Koggiung KVV ..	Alaska ..	FX
KII	S. Francisco KII ..	U.S.A. ..	P	KVW	Seattle KVW (T) ..	U.S.A. ..	FX
KIL	Jolo ..	Phil. Is. ..	PG	KWH	Los Angeles KWH (T)	U.S.A. ..	FX B
KIM	Latouche ..	Alaska ..	PG				
KIV	Puerto Princessa ..	Phil. Is. ..	PG	KWO	Port Beauclair ..	Alaska ..	FX
KIW	Zamboanga ..	Phil. Is. ..	PG	KWQ	Saltchuck ..	Alaska ..	FX
KIX	Cuyo ..	Phil. Is. ..	PG	KWR	Port Moller ..	Alaska ..	PR
KIY	S. José ..	Phil. Is. ..	PG	KWS	Lost Harbor ..	Alaska ..	FX
KIZ	Malabang ..	Phil. Is. ..	PG	KWT	Palo Alto ..	U.S.A. ..	FX
KJA	Pysht (T) ..	U.S.A. ..	FX				

KWW	Radioville ..	Alaska ..	PG	MFT	Clifden Radio ¹ ..	Gt. Brit.	FX
KXX	Funter ..	Alaska ..	FX	MGR	Mongalla ..	Sudan ..	O
KXV	Nelson Lagoon ..	Alaska ..	FX	MLR	Malakal ..	Sudan ..	O
KXW	Ikatan ..	Alaska ..	FX	MPD	Poldhu Radio ..	Gt. Brit.	FX
KYG	Laguna Bell Cp. (T)	U.S.A. ..	FX	MUU	Carnarvon Radio ..	Gt. Brit.	FX
KYI	Culver City KYI T	U.S.A. ..	FX	NAA	Washington NAA ..	U.S.A. ..	FX W.
KYJ	Culver City KYJ T	U.S.A. ..	FX				T. Press
KYK	Karluk ..	Alaska ..	FX				Nav
KYL	Alitak ..	Alaska ..	FX	NAB	Cape Elizabeth ..	U.S.A. ..	DF
KZAB	Basco ..	Phil. Is.	PG	NAB	Portland NAB ..	U.S.A. ..	O W
KZAC	Calapan ..	Phil. Is.	PG	NAB	Portland NAB ..	U.S.A. ..	O
KZE	Aberdeen ..	U.S.A. ..	PR	NABT	Swiftsure Bank	U.S.A. ..	PR*
					Light Vessel		
LBZ	Karljohansvern ..	Norway	O	NABV	Cape Lookout ..	U.S.A. ..	PR*
LCH	Christiania ..	Norway	W		Shoals Light Vessel		
LCM	Stavanger ..	Norway	FX	NABX	Brunswick Light	U.S.A. ..	PR*
LDB	Vaeroy ..	Norway	FX		Vessel		
LDF	Flekkeroy Radio ..	Norway	PG	NAC	Portsmouth ..	U.S.A. ..	O
LDW	Fauske Radio ..	Norway	PG W	NACD	Relief NACD ..	U.S.A. ..	PG*
Le	Le Bourget	France	A Cal.	NACT	Blunts Reef Light	U.S.A. ..	PR* Bea
	Aerodrome FNB (T)				Vessel		
LEI	Ingöy Radio ..	Norway	PG	NACV	Umatilla Reef Light	U.S.A. ..	PR*
LEN	Sörvagen ..	Norway	PG		Vessel		
LET	Tjöme ..	Norway	PG	NAD	Boston NAD ..	U.S.A. ..	O Nav
LFG	Spitsbergen ..	Norway	PG W				W T*
LFR	Röst ..	Norway	PG DF	NAD	Deer Island ..	U.S.A. ..	DF
L GK	Utsire Radio ..	Norway	PG DF	NAD	Fourth Cliff ..	U.S.A. ..	DF
LGN	Bergen Radio ..	Norway	PG W	NAD	Gloucester ..	U.S.A. ..	DF
LIA	Buenos Aires ¹ ..	Argentina	—	NADB	Relief NADB ..	U.S.A. ..	PG*
LIB	Trelew ² ..	Argentina	—	NADT	Winter Quarter	U.S.A. ..	PR*
LIC	Gallegos ² ..	Argentina	—		Shoals Light		
LIG	Corrientes LIG ¹ ..	Argentina	—		Vessel		
LIH	Dársena Norte ..	Argentina	PG T	NADV	Five Fathom Bank	U.S.A. ..	PR
LII	Puerto Belgrano ..	Argentina	PG		Light Vessel		
LIJ	Comodoro Rivadavia ..	Argentina	PG	NAE	Cape Cod ..	U.S.A. ..	O
LIK	Ushuaia ..	Argentina	PG	NAE	North Truro ..	U.S.A. ..	DF
LIO	Año Nuevo ..	Argentina	PG	NAF	Newport Rhode Is.	U.S.A. ..	O T*
LIS	Puerto Aguirre ..	Argentina	PG	NAF	Price's Neck ..	U.S.A. ..	DF
LIT	Eldorado Misiones ..	Argentina	FX	NAFT	Pollock Rip Slue	U.S.A. ..	PR
LIU	Formosa ..	Argentina	PG		Lightship		
LIV	Posados Misiones ..	Argentina	PG	NAH	Fire Island ..	U.S.A. ..	DF
LIW	La Paz ..	Argentina	PG	NAH	Manasquan ..	U.S.A. ..	DF
LIX	Zarate ..	Argentina	O	NAH	New York NAH ..	U.S.A. ..	O W
LIY	Martin Garcia ..	Argentina	PG				Nav T*
LIZ	Rio Santiago ..	Argentina	O	NAH	Sandy Hook ..	U.S.A. ..	DF
LJA	Faro San Antonio ² ..	Argentina	—	NAI	Philadelphia NAI ..	U.S.A. ..	Nav
LJB	Punta Mogotes ..	Argentina	PG				W
LJC	Punta Delgada ..	Argentina	PG	NAJ	Great Lakes ..	U.S.A. ..	PG W T
	Chubut ..			NAJC	Relief NAJC ..	U.S.A. ..	PG*
LJD	S. Julian ..	Argentina	PG	NAJS	Fenwick Island	U.S.A. ..	PR*
LJE	Cabo de las Virgenes ..	Argentina	PG		Shoal Light Vessel		
LJF	Rio Grande ..	Argentina	PG	NAJT	Columbia River	U.S.A. ..	PR* Bea
LJK	Practicos Recalada ..	Argentina	PG		Light Vessel		
LJL	Interseccion Rio de	Argentina	O	NAJV	Cape Charles Light	U.S.A. ..	PR*
	la Plata Ponton				Vessel		
LJM	Recalada Bahia Blan.	Argentina	O	NAK	Annapolis NAK ..	U.S.A. ..	O
	Ponton Faro			NAKS	San Francisco Light	U.S.A. ..	PR* Bea
LNA	Direccion General de	Argentina	O		Vessel		
	Arsenales de Geurra			NAL	Washington NAL ..	U.S.A. ..	O
LNC	Cordoba ² ..	Argentina	O	NALS	Ambrose Channel	U.S.A. ..	PR* Bea
LND	Palomar (El) ..	Argentina	O		Light Vessel		
LNG	Colegio Militar ..	Argentina	O	NAM	No. Virginia ..	U.S.A. ..	PG
LNL	Liniers ..	Argentina	O				Nav
LNM	Mendoza ..	Argentina	O				W T*
LNR	Comando Ira Divi-	Argentina	O	NAM	Virginia Beach NAM	U.S.A. ..	FX
	sion, Ejercito			NAN	Cape Lookout ..	U.S.A. ..	DF
LNS	Comando 2da Divi-	Argentina	O	NAN	Moorhead City ..	U.S.A. ..	PG
	sion, Ejercito			NAO	Charleston ..	U.S.A. ..	PG
LNT	Tucuman ² ..	Argentina	O				Nav
LP	Konigs-Wusterhau-	Germany	FX B				W T*
	sen			NAP	S. Augustine ..	U.S.A. ..	PG W
LPA	Rosario de Santa Fé	Argentina	O	NAQ	Jupiter NAQ ..	U.S.A. ..	PG W
LPB	Parana ..	Argentina	O	NAQ	Jupiter NAQ ..	U.S.A. ..	DF
LPC	Corrientes LPC ..	Argentina	O	NAR	Key West NAR ..	U.S.A. ..	DF
LPD	Puerto Bermejo ..	Argentina	O	NAR	Key West NAR ..	U.S.A. ..	PG
LPZ	Monte Grande ..	Argentina	FX				W T
LWP	Bear Island ..	Norway	P				Press
LY	Bordeaux Lafayette	France	FX T	NARS	North East End	U.S.A. ..	PR*
	T.S.F.				Light Vessel		
Lympne	Lympne Radio ..	Gt. Brit.	A FX	NAS	Pensacola NAS ..	U.S.A. ..	PG W
LZF	Varna ..	Bulgaria	PG	NAS	Pensacola NAS ..	U.S.A. ..	DF

NASC	Cornfield Point Light Vessel	U.S.A. ..	PR*	NPH	Hilo ..	Hawaiian Islands	FX
NAT	New Orleans NAT	U.S.A. ..	O W T	NPI	Farallon Island ..	U.S.A. ..	DF
NAU	Cayey	Porto ..	O	NPJ	Shanghai NPJ ..	China ..	O
		Rico		NPK	Point Arguello ..	U.S.A. ..	DF
NAU	S. Juan	Porto ..	PG	NPL	Imperial Beach ..	U.S.A. ..	DF
		Rico	W Nav	NPL	Point Loma ..	U.S.A. ..	DF
NAV	Paris Island	U.S.A. ..	PG W		S. Diego ..	U.S.A. ..	PG
NAW	Guantanamo	Cuba ..	PG W				W T
NAX	Colon	Panama	PG				Press
			T Press	NPM	Honolulu NPM ..	Hawaiian Islands	O
NAY	Brownsville	U.S.A. ..	PG WT				
NAZ	Managua	Nicaragua	O	NPM	Pearl Harbor NPM	Hawaiian Islands	O Nav*
NAZJ	Light Vessel No. 34	U.S.A. ..	PG*				T W
NAZR	Light Vessel No. 46	U.S.A. ..	PG*	NPN	Guam ..	Pacific Is.	PG
NBA	Balboa	Panama	PG	NPO	Cavite ..	Phil. Is.	PG T
			T Press	NPP	Peking NPP ..	China ..	O
NBB	S. Thomas	Virgin Is.	PG W	NPO	S. Paul ..	Alaska ..	PG Nav
			Nav	NPR	Dutch Harbor ..	Alaska ..	PG
NBD	Bar Harbour	U.S.A. ..	PG DF	NPS	Kodiak ..	Alaska ..	PG
			Press	NPT	Olongapo ..	Phil. Is.	O
NBG	Indian Head	U.S.A. ..	O	NPU	Tu Tuila ..	Samoa ..	PG W
NBM	Amagansett	U.S.A. ..	O DF				Nav
NBS	Siasconset	U.S.A. ..	O	NPV	Seward ..	Alaska ..	PG
NBS	Surfside	U.S.A. ..	DF	NPW	Eureka NPW ..	U.S.A. ..	PG W T
NBX	Pert Eads	U.S.A. ..	DF				DF
NBX	South Pass	U.S.A. ..	DF	NPX	Inglewood ..	U.S.A. ..	O
NCM	Tau	Samoa	PG	NPX	Point Fermin ..	U.S.A. ..	DF
NCZ	Hogg Island	U.S.A. ..	DF	NPX	S. Pedro ..	U.S.A. ..	PG W
NCZ	Poyner's Hill	U.S.A. ..	DF	NPY	S. George ..	Alaska ..	PG
NCZ	Virginia Beach	U.S.A. ..	DF	NRK	Puerto Obaldia ..	Panama	PG
NDD	Washington NDD	U.S.A. ..	O	NRM	Cape Hinchbrook ..	Alaska ..	DF
NDW	Cape Hatteras NDW	U.S.A. ..	PG	NSC	Port au Prince ..	Haiti ..	PG W
NDW	Cape Hatteras NDW	U.S.A. ..	DF	NSD	Bethany Beach ..	U.S.A. ..	DF
NDY	Dahlgren	U.S.A. ..	O	NSD	Cape Henlopen ..	U.S.A. ..	DF
NEL	Lakehurst NEL	U.S.A. ..	O	NSD	Cape May NSD ..	U.S.A. ..	DF
NEL	Lakehurst NEL	U.S.A. ..	DF	NSF	Anacostia NSF ..	U.S.A. ..	A
NEV	Savannah NEV	U.S.A. ..	PG W	NSF	Anacostia NSF ..	U.S.A. ..	DF
NEV	Tybee Island	U.S.A. ..	DF	NSR	Nasser ..	Sudan ..	O
NFH	Smith Island	U.S.A. ..	DF	NSS	Washington NSS ..	U.S.A. ..	O T
NFN	Cattle Point ¹	U.S.A. ..	DF				Press.
NFT	New Dungeness	U.S.A. ..	DF				Nav. W
NEV	Quantic	U.S.A. ..	—	NUG	Eagle Harbour NUG	U.S.A. ..	DF
NGX	Ofu	Samoa	PG	NUW	Soapstone Point ..	Alaska ..	DF
NITQ	Diamond Shoals Light Vessel	U.S.A. ..	PR* Bea	NVD	Juneau ..	Alaska ..	PG
				NVH	Ketchikan ..	Alaska ..	PG
NITR	Relief NITR	U.S.A. ..	PG*	NYR	Nyala ..	Sudan ..	O
NITS	Relief NITS	U.S.A. ..	PG*	NZO	Annapolis NZO ..	U.S.A. ..	FX
NJG	S. Domingo City	U.S.A. ..	PG	NZS	Fort Stevens NZS	U.S.A. ..	DF
NKB	Galveston	U.S.A. ..	PG W	NZS	Ocean Pk. Wash'tn	U.S.A. ..	DF
			Nav	NZT	Grand Marias ..	U.S.A. ..	DF Nav
NKC	Navassa Island W.I.	W. In. ..	PG	NZT	Whitefish Point ..	U.S.A. ..	DF W
NKF	Washington NKF	U.S.A. ..	FX	NZU	Detour Point ..	U.S.A. ..	DF Nav
NLA	Nantucket Shoals Light Vessel	U.S.A. ..	PR* Bea	NZV	Folly Island ..	U.S.A. ..	DF
				NZW	North Island ..	U.S.A. ..	DF
NLC	Frying Pan Shoals Light Vessel	U.S.A. ..	PR*	OAA	Callao ..	Peru ..	PG
NLD	Bird Island	U.S.A. ..	DF	OAB	Cachendo ..	Peru ..	PG
NLG	Point Reyes NLG	U.S.A. ..	DF	OAC	Chala ¹ ..	Peru ..	PG
NLH	Point Montara	U.S.A. ..	DF	OAD	Puerto Maldonado ..	Peru ..	Rec.
NLP	Heald Bank Light Vessel	U.S.A. ..	PR*	OAE	Puerto Burmudez ¹	Peru ..	PG
				OAF	Fronton ..	Peru ..	O
NLS	Fire Island Light Vessel	U.S.A. ..	PR* Bea	OAG	Eten ..	Peru ..	PG
				OAL	Ilo ..	Peru ..	PG
NMD	Point Hueneme	U.S.A. ..	DF	OAM	Masisea ..	Peru ..	PG
NNI	S. Croix	Virgin Is.	PG W	OAN	Magdalena del Mar	Peru ..	FX
			Nav	OAQ	Orellará ¹ ..	Peru ..	PG
NNT	Cape Mala	Panama	PG	OAP	Pisco ..	Peru ..	PG
NNW	La Palma	Panama	PG	OAQ	Leticia ..	Peru ..	PG
NOF	Anacostia NOF	U.S.A. ..	FX	OAS	Casma ..	Peru ..	PG
NPA	Cordova	Alaska ..	PG	OAT	Trujillo ..	Peru ..	PG
NPB	Sitka	Alaska ..	PG	OAU	El Encanto ..	Peru ..	PG
NPC	Puget Sound	U.S.A. ..	PG	OAY	Iquitos ..	Peru ..	PG
NPD	Tatoosh NPD	U.S.A. ..	O	OAZ	Lima San Christobal	Peru ..	PG
NPD	Tatoosh NPD	U.S.A. ..	DF	OJA	Helsingfors ..	Finland	FX W
NPE	Astoria	U.S.A. ..	O	OJB	Wiborg ..	Finland	PG
NPE	North Head	U.S.A. ..	O	OJC	Kotka ..	Finland	O
NPF	Empire	U.S.A. ..	DF	OJD	Hangö ..	Finland	PG
NPF	Marshfield	U.S.A. ..	O	OJE	Abo ..	Finland	O
NPG	S. Francisco NPG	U.S.A. ..	Nav W	OJG	Waasa ..	Finland	O
			T Press	OKP	Prague ..	Czecho Slovakia	FX W A Press

ONA	Banana	Bel. Congo	PG	PQK	S. Maria	Azores	PG
OPO	Uccle Bruxelles Institut Meteorologique	Belgium	W	PQL	Lisbon Radio ..	Portugal	PG
				PQM	S. Miguel	Azores	PG
OPVH	Bruxelles Haren - Aërodrôme	Belgium	A	PQP	Oporto	Portugal	PG
OPVO	Ostende Aërodrôme	Belgium	A	PQT	Terceira Radio ..	Azores	PG
Oran	Oran Aerodrome	Algeria	A FX	PQU	Funchal	Madeira	PG
OSA	Antwerp Radio ..	Belgium	PG	PRG	Prague (T)	Czecho-Slov.	B
OST	Ostend Radio	Belgium	PG	PTC	Forteleza de Santa Cruz	Brazil ..	O
OTW	Westhinder Lights'p	Belgium	O W	PTI	Forteleza de Imbuhy	Brazil ..	O
OUB	Skagens Rev.	Denmark	Nav PR	PTJ	Forteleza de S. Joao	Brazil ..	O
OUC	Schultz Grund	Denmark	—	PTL	Forteleza da Lage	Brazil ..	O
OUE	Gilleleje,	Denmark	PR	PTN	Nietheroy	Brazil ..	O
	Flak N.			PTQ	Quartel General ..	Brazil ..	O
OUI	Elivese	Germany	FX Press	PTV	Villa Militar ..	Brazil ..	O
OUK	Læsø Rende	Denmark	PR	Pulham	Pulham DF	Gt. Brit.	DF A
OUR	Annholt-Knob	Denmark	Nav PR	Pulham	Pulham Radio (T)	Gt. Brit.	A FX
OUT	Læsø Trindel	Denmark	Nav PF	PWA	Habana	Cuba ..	FX
OUU	Gjedser, Rev.	Denmark	Nav PF	PWB	Nueva Gerona ..	Cuba ..	FX
OUW	Drogden	Denmark	PR Nav	PWC	S. Clara	Cuba ..	PG
OUX	Graadyb	Denmark	Nav PR	PWD	Chaparra	Cuba ..	PG
OUY	Vyl	Denmark	Nav PR	PWE	Baracoa	Cuba ..	PG
OUZ	Horns Rev	Denmark	Nav PR	PWF	Pinar del Rio ..	Cuba ..	FX
OXA	Copenhagen Radio ..	Denmark	PG	PWG	La Fe	Cuba ..	PG
OXB	Blaavand Radio ..	Denmark	PG				
			Nav*.	RAA	Astrakhan	Russia ..	FX
OXC	Gjedser	Denmark	O	RAB	Bakou	Russia ..	FX
OXD	Gjedser Havn	Denmark	PR	RAD	Vologda	Russia ..	FX
OXE	Lynghby Radio	Denmark	FX W	RAE	Viatka	Russia ..	FX
OXJ	Thorshavn	Faroe Is	PG W*	RAF	Waladikawkaz ..	Russia ..	FX
OXK	Iverra	Faroe Is	FX	RAG	Kiew	Russia ..	FX
PA 5	Amsterdam	Holland	B	RAH	Kouchka	Russia ..	FX
PCA	Amsterdam PCA ..	Holland	O	RAI	Moscow Oktiabrskaja	Russia ..	FX
PCB	Helder PCB	Holland	O	RAJ	Moscow Imeni	Russia ..	FX
PCC	Helder PCC	Holland	O		Mossoveta		
PCD	Flushing	Holland	O	RAK	Nicolaiew	Russia ..	FX
PCE	De Mok	Holland	O	RAI	Novo-Nicolaievsk ..	Russia ..	FX
PCF	Vliegkampen	Holland	O	RAM	Orenbourg	Russia ..	FX
PCFF	Amsterdam	Holland	B	RAN	Obdorsk	Russia ..	FX
PCG	Zootwijk-Sambeek ..	Holland	FX	RAO	Rostowdon	Russia ..	FX
PCGG	The Hague	Holland	B	RAP	Saratov	Russia ..	FX
PCH	Scheveningen Port ..	Holland	PG W	RAQ	Samara	Russia ..	FX
			Nav*	RAR	Simbersk	Russia ..	FX
PCKK	The Hague (Velt-huyzen)	Holland	B	RAS	Smolensk	Russia ..	FX
PCM	Terschellingerbank Lightship	Holland	Sp. W*	RAT	Simferopol	Russia ..	FX
PCMM	Ijmuiden	Holland	B	RAU	Taschkent	Russia ..	FX
PCN	Noord-Hinder L'ship	Holland	Sp. W*	RAV	Taganrog	Russia ..	FX
PCUU	The Hague (Heussen Lab.)	Holland	B	RAV	Taganrog 2	Russia ..	PG
				RAW	Touapse	Russia ..	FX
PJA	Aruba	D. W. Ind.	FX	RAX	Oufa	Russia ..	FX
PJB	Bonaire	D. W. Ind.	FX	RAY	Feodosia	Russia ..	FX
PJC	Curacao	D. W. Ind.	PG	RAZ	Khartow	Russia ..	FX
PJD	S. Martin	D. W. Ind.	PG	RBA	Tzaritzyne	Russia ..	FX
PJN	Paramaribo Radio ..	D. W. Ind.	PR	RBB	Tscheliabinsk ..	Russia ..	FX
PJO	Moengo	D. W. Ind.	P	RBC	Semipalatinsk ..	Russia ..	FX
PKA	Sabang Radio	D. E. Ind.	PG	RBW	Ermak	Russia ..	PG
PKB	Wetvreden Radio ..	D. E. Ind.	PG	RCC	Tver	Russia ..	Rec.
PKC	Sitoebondo Radio ..	D. E. Ind.	PG	RCD	Anadyr	Russia ..	PG
PKD	Koepang Radio	D. E. Ind.	PG	RCE	Arkhangel	Russia ..	PG
PKE	Amboina	D. E. Ind.	PG	RCF	Batoun	Russia ..	O
PKF	Balikpapan Radio ..	D. E. Ind.	PG	RCG	Fort d'Alexandrovsk	Russia ..	PG
PKG	Tarakan Radio	D. E. Ind.	PG	RCH	Kerbinskaia	Russia ..	—
PKH	Soerabaja Radio ..	D. E. Ind.	O	RCI	Kertch	Russia ..	O
PKI	Neira, Banda	D. E. Ind.	FX	RCJ	Kronstadt	Russia ..	O
PKK	Manokwari	D. E. Ind.	FX	RCK	Mare-Sale	Russia ..	PG
PKM	Tjilatjap Radio ..	D. E. Ind.	PG	RCL	Nalakan	Russia ..	PG
PKN	Semarang Radio ..	D. E. Ind.	PG	RCM	Nicolaiewsk RCM	Russia ..	O
PKO	Dobo	D. E. Ind.	FX	RCN	Nicolaiewsk RCN	Russia ..	PG
PKQ	Endeh	D. E. Ind.	FX	RCO	Okhotsk	Russia ..	PG
PKR	Bima	D. E. Ind.	FX	RCP	Petropavlovsk Radio	Russia ..	PG
PKU	Waingapoe	D. E. Ind.	FX	RCQ	Petrowsk Daghestan	Russia ..	PG
PKV	Cheribon Radio ..	D. E. Ind.	PG	RCR	Astrakhan Radio ..	Russia ..	PG
PKX	Malabar	D. E. Ind.	FX T	RCS	Taganrog Radio ..	Russia ..	PG
POZ	Nauen	Germany	FX T	RCT	Sebastopol	Russia ..	O W
			Nav Press				Nav
PQC	Corvo	Azores ..	FX	RCU	Vaigatch	Russia ..	PG
PQF	Flores	Azores ..	PG	RCV	Vladivostok RCV ..	Russia ..	O
PQH	Faial	Azores ..	PG	RCW	Vladivostok RCW ..	Russia ..	O
				RCX	Yougorski-char ..	Russia ..	PG
				RDA	Lenine (Petrograd)	Russia ..	PG
				RDE	Odessa RDE	Russia ..	PG

RDG	Sredne-Kolymsk	Russia ..	FX	SQX	Xapury ..	Brazil ..	FX
RDH	Odessa Observatory	Russia ..	FX	STB	Soesterberg (T) ..	Holland	A W
RDI	Petrozawadsk ..	Russia ..	FX	St.	St. Inglevert	France ..	A FX
RDJ	Starata Boukhara	Russia ..	FX	Inglevert	Aerodrome (T)	W	
RDK	Tiflis ..	Russia ..	FX	SUC	Abu Zabal Radio	Egypt ..	FX W
RDM	Rotterdam (T) ..	Holland	A	SUD	Port Sudan Radio	Egypt ..	PG
RDN	Novorossiisk ..	Russia ..	PG	SUH	Alexandria Radio	Egypt ..	PG
RDU	Svobodnenskaia	Russia ..	FX	SUL	Khartoum ..	Sudan	O
RDV	Tchita ..	Russia ..	FX	SXA	Athens No. 1 ..	Greece ..	O
RDW	Moscow Imeni Komintern	Russia ..	FX	SXA	Athens No. 2 ..	Greece ..	O
	Poti ..	Russia	PG	SXB	Athens Radio ..	Greece ..	PG
RDX	Eriwan ..	Russia	FX	SXC	Thessalonika ..	Greece ..	O
RDY	Krasnovodsk ..	Russia	PG	SXD	Alexandropolis ..	Greece ..	O
RDZ	Isakogorka ..	Russia ..	PG W	SXF	Fassa ..	Greece ..	O
REA			Nav* T	SXG	Athens Botanique No. 1	Greece ..	W Press
					Athens Botanique No. 2	Greece ..	O
REB	Morjovets ..	Russia ..	PG	SXI	Isthme de Corinthe	Greece ..	Sp
REC	Kanin Nos ..	Russia ..	PG	SXX	Corfu No. 1 ..	Greece ..	O
RED	Iokanga ..	Russia ..	PG	SXX	Corfu No. 2 ..	Greece ..	O
REE	Mourmansk ..	Russia ..	PG	SXX	Corfu No. 3 ..	Greece ..	PG
REF	Tsyp Navolok ..	Russia ..	PG	SXL	Salamis ..	Greece ..	O
REG	Oust-Sysolsk ..	Russia ..	FX	SXM	Samos ..	Greece ..	O
REK	Feodosia Port ..	Russia ..	PG	SXO	Chios ..	Greece ..	O
REN	Bakhmont ..	Russia ..	FX	SXP	Poros ..	Greece ..	O
REO	Poltava ..	Russia ..	FX				
RES	Ourda ..	Russia ..	FX	TFA	Reykjavik Radio ..	Iceland ..	PG
RET	Detskoie Selo ..	Russia ..	FX	TFB	Flately a Breidafirdi	Iceland ..	PG
KEZ	Ekater nburg ..	Russia ..	FX	TFC	Vestmannaeyjar Radio	Iceland ..	PG
Rotter-	Rotterdam	Holland	A	TRW	Lille Faerder Light- house	Norway	Pea
dam	(Telephony)			UA	Nantes Basse-Lande	France ..	PR O
RT	Rotterdam ..	Holland	FX				Nav*
SAA	Karlskrona Radio	Sweden	PG	UFP	S. Assise ..	France ..	FX
			Nav*	UFQ	S. Assise ..	France ..	FX
SAB	Goteborg Radio ..	Sweden	PG DF	UFR	S. Assise ..	France ..	FX
			Nav*	UFT	S. Assise ..	France ..	FX
SAC	Tralleborg Radio ..	Sweden	PR	UFU	S. Assise ..	France ..	FX
SAE	Gottland Radio ..	Sweden	PG				
			Nav*	UNBB	Pancevo ..	Ugoslavia	AW
SAF	Vaxholm Radio ..	Sweden	PG	UNK	Herzegrovi ..	Ugoslavia	O
			Nav*	UNS	Sibenik ..	Ugoslavia	O
SAG	Olandsrev Lightship	Sweden	Sp.	VAA	Halifax Dockyard	Canada ..	O
SAH	Harnosand Radio ..	Sweden	PG	VAB	Point Grey ..	Canada ..	PG W*
			Nav*				Nav
SAI	Boden Radio ..	Sweden	PG	VAC	Cape Lazo ..	Canada ..	PG V*
			Nav*				av
SAJ	Karlsborg Radio ..	Sweden	T FX	VAD	Pachena D.F. ..	Canada	D.F.
			W Nav	VAE	Estevan ..	Canada ..	PG W*
			Press	VAF	Alert Bay ..	Canada ..	PG W*
SAK	Grundkalle L'ship.	Sweden	Sp.	VAG	Bull Harbour ..	Canada ..	Nav
SAL	Vinga, Sw ..	Sweden	DF	VAH	Dead Tree Point ..	Canada	PG W*
SAM	Hallö ..	Sweden	DF	VAJ	Digby Island ..	Canada	Nav
SFR	Levallois-Perret ..	France	B	VAK	Gonzales Hill ..	Canada	PG W*
SNI	Ilha das Cobras ..	Brazil ..	O				Nav
SNN	Abrolhos ..	Brazil ..	O	VAR	S. John DF	Canada	DF
SNQ	Boqueirao Island ..	Brazil ..	O	VAR	S. John ..	Canada	PG
SNR	Natal Norte ..	Brazil ..	PG	VAS	Louisburg ..	Canada	PR
SNU	Ladario ..	Brazil ..	O	VAT	S. Pauls Island ..	Canada	DF
SNV	Villegaignon ..	Brazil ..	O	VAV	Chebucto Head DF	Canada	DF
SNW	Armacão ..	Brazil ..	O	VAX	Canso DF ..	Canada	DF
SNZ	Raza Island ..	Brazil ..	O	VAZ	Cape Race DF ..	Canada	DF
SOD	Anhatomirim ..	Brazil ..	PR	VBA	Port Arthur ..	Canada	W* Nav
SOH	Governador Island	Brazil ..	O				PG
SOM	S. Luiz do Maranhão	Brazil ..	PG	VBB	Sault Ste. Marie ..	Canada	PG W*
SOQ	Mocangue Island ..	Brazil ..	O	VBC	Midland ..	Canada	Nav
SPA	Amaralina ..	Brazil ..	PG	VBD	Tobermory ..	Canada	PG W*
SPB	Para (Belem) ..	Brazil ..	FX	VBE	Point Edward ..	Canada	Nav
SPJ	Juncão ..	Brazil ..	PG	VBF	Port Burwell ..	Canada	PG W*
SPN	Fernando de Noronha	Brazil ..	PG				Nav
SPO	Olinda Pernambuco	Brazil ..	PG				
SPS	Montserrat ..	Brazil ..	PG				
SPT	Cape St. Thomé ..	Brazil ..	PG				
SPY	Rio de Janeiro ..	Brazil ..	PG				
SQC	Cruzeiro do Sul ..	Brazil ..	FX				
SQL	Labrea Brasil ..	Brazil ..	FX				
SQM	Manaos ..	Brazil ..	FX				
SQN	Senna Madureira ..	Brazil ..	FX				
SQR	Rio Branco Acre ..	Brazil ..	FX				
SQS	Santarem ..	Brazil ..	FX				
SQT	Tarauaca ..	Brazil ..	FX				
SQV	Porto Velho ..	Brazil ..	FX				

VBG	Toronto	Canada	PG W*	VNV	Walvis Bay Radio ¹	Brit. S.W. Africa	PG
VBH	Kingston	Canada	Nav	VOA	Battle Harbour ..	Labrador	FX
VBM	Le Pas ¹	Canada	PG W*	VOB	Venison Islands ..	Labrador	FX
VBN	Port Nelson ¹ ..	Canada	FX	VOC	American Tickle ..	Labrador	FX
VCA	Montreal	Canada	PG	VOD	Domino	Labrador	FX
VCC	Quebec	Canada	PG W*	VOE	Grady	Labrador	FX
VCD	Grosse Isle ..	Canada	Nav	VOF	Smokey Tickle ..	Labrador	FX
VCE	Cape Race	Newf'land	PG W*	VOG	Holton	Labrador	FX
VCF	Father Point ..	Canada	Nav	VOH	Cape Harrison ..	Labrador	FX
VCG	Fame Point ¹ ..	Canada	PG W*	VOI	Makkovik	Labrador	FX
VCI	Heath Pt. L'ship ..	Canada	Nav	VOJ	Fogo	Newf'land	FX
VCK	Clarke City ..	Canada	PG W*	VPB	Colombo Radio ..	Ceylon	PG
VCL	Point Amour ..	Newf'land	Nav	VPC	Falkland Island ..	Falk. Is.	PG
VCM	Belle Isle	Newf'land	PG W*	VPD	Suva	Fiji Is.	PG W
VCN	Grindstone Island	Canada	Nav	VPE	Labasa	Fiji Is.	PG W*
VCO	North Sydney ..	Canada	PG W	VPF	Taveuni	Fiji Is.	PG W*
VCS	Camperdown ..	Canada	Nav	VPG	Accra	Gold Cst.	PG
VCT	Sable Islands ..	Canada	W Nav	VPJ	Berbera Radio ..	Br. Somal.	PG
VCU	Cape Sable	Canada	Dis Bea	VPK	Cocos	Cocos	PG
VDR	Lurcher Lightship	Canada	PG W*	VPL	Trinidad	Keeling Is.	Nav*
VIA	Adelaide Radio ..	Australia	Nav	VPM	Tobago	Br. W. In.	PG
VIB	Brisbane Radio ..	Australia	PG W	VPN	Nassau	Bahamas	PG
VIC	Cooktown Radio ..	Australia	PG W*	VPO	Barbados	B. W. Ind.	PG
VID	Darwin	Australia	Nav	VPP	Belize	Br. Hond.	PG W
VIE	Esperance Radio ..	Australia	PG W*	VPQ	Mombasa	Kenya Col	PG
VIF	Woodlark Is. Radio ³	N. Guinea	PG W*	VPS	Cape d'Aguilar ..	Hong Kong	PG W
VIG	Pt. Moresby Radio ..	N. Guinea	Nav	VPT	Malta	Malta ..	PG
VIH	Hobart Radio ..	Australia	PG W*	VPU	Sierra Leone ..	S. Leone	PG
VII	Thursday Is. Radio	Australia	Nav	VPW	Singapore Radio ..	Sts. S'mts	PG
VIJ	Samurai Radio ..	N. Guinea	PG W*	VPX	Penang Radio ..	Sts. S'mts	PG
VIL	Flinders Is. Radio	Australia	Nav	VPY	Lagos	Nigeria..	PG
VIM	Melbourne Radio ..	Australia	PG W	VPZ	Zanzibar	Zanzibar	PG
VIN	Geraldton Radio ..	Australia	Nav	VQA	Jesselson	B.N. B'neo	PG
VIO	Broome Radio ..	Australia	W Nav	VQB	Sandakan	B.N. B'neo	Nav*
VIP	Perth Radio ..	Australia	Dis	VQC	Tawao	B.N. B'neo	PG
VIR	Rockhampton Radio	Australia	Nav	VQD	Kudat	B.N. B'neo	Nav*
VIS	Sydney Radio ..	Australia	PG W	VQE	Pemba	Zanzibar	PG
VIT	Townsville Radio ..	Australia	PG W*	VQF	Kuching (T) ..	Sarawak	PG T
VIU	Kieta Radio ..	Solomon Islands	PG	VQG	Toco	B. W. Ind.	O
VIV	Madang Radio ..	N. Guinea	PG W*	VQH	S. Lucia	B. W. Ind.	PG
VIW	Wyndham Radio ..	Australia	Nav	VQI	Kingston	Jamaica	PG W
VIX	Misima Radio ..	N. Guinea	PG	VQJ	Tulagi	Solomon Islands	PG
VJZ	Rabaul Radio ..	New Brit.	PG W*	VQK	Ocean Island ..	Gilbert & Ellice Is.	PG
VKT	Nauru Radio ..	Marshall Island	PG	VQL	Savu Savu ..	Fiji Is. ..	FX
VLA	Awanui	N. Zealand	Nav	VQP	Miri (T)	Sarawak	PG
VLB	Awarua	New Zea.	PG	VQQ	Kismayu	Kenya Col	PG
VLC	Chatham Island ..	New Zea.	PG W*	VQV	Sibu (T)	Sarawak	PG
VLD	Auckland Radio ..	New Zea.	Nav	VQW	Sadong (T) ..	Sarawak	PG
VLW	Wellington Radio..	New Zea.	PG	VQX	Burao	Br. Somal.	—
VMG	Apia Radio ..	Samoa Is.	PG W	VQY	Las Dureh ..	Br. Somal.	FX
VMR	Rarotonga ..	New Zea.	PG W*	VQZ	Fox Bay	Falk Is.	FX
VNC	Capetown	S. Africa	PG	VRK	Tug Labourdonnais	Mauritius	PG
VND	Durban Radio ..	S. Africa	PG W	VSA	Hargeisa	Br. Somal.	FX
VNF	Dassen Island Radio	S. Africa	PG	VSF	Nukualofa Radio	Tonga Is.	PG W
VNI	Jacobs Natal Radio	S. Africa	FX	VSG	Bimini	Bahamas	PG
VNJ	Port Nolloth Radio	S. Africa	O	VSD	Goebilt (T) ..	Sarawak	PG
VNO	East London Radio	S. Africa	PG	VSE	Governor's Harbour	Bahamas	PG
VNQ	Port Elizabeth Radio	S. Africa	PG W	VSH	Harbour Island ..	Bahamas	PG
				VSI	Inagua	Bahamas	PG
				VSJ	Bathurst	Gambia	PG
				VSK	Grand Turk T. ..	B. W. Ind.	PG
				VSL	Brunei	Brunei ..	FX
				VSM	Labuan	Brunei ..	FX
					Temburong ..	Brunei ..	FX
					Christmas Island..	Christmas Is. (Brit.)	PR
				VSN	Silimpopon ..	Br. N. Borneo	P
				VSO	Elbow Cay ..	Bahamas	PG
				VSP	Normans Castle ..	Bahamas	PG
				VTC	Basrah Radio ..	Persian G.	PG
				VTE	Bahrein	Persian G.	PG
				VTF	Bushire	Persian G.	PG

VTH	Henjam	Persian G.	PG	WIM	Chatham	U.S.A. ...	PG
VTL	Lingah	Persian G.	PG	WIO	Fort Morgan WIO	U.S.A. ...	PG
VTP	Port Blair	India ..	PG W	WJAV	Bowling Green (T)	U.S.A. ...	FX
			Nav	WJB	Lawrenceville (T) ..	U.S.A. ...	FX
VTR	Rangoon Radio ..	India ..	PG W	WJC	Owensboro (T) ..	U.S.A. ...	FX
			Nav				
VTV	Victoria Point ..	India ..	PG	WJE	Skagit Power Site (T)	U.S.A. ...	FX
VVO	Poona Radio ..	India ..	FX	WJJ	Tullahoma ..	U.S.A. ...	FX
VWA	Allahabad Radio ..	India ..	FX	WJQ	Jackson (T) ..	U.S.A. ...	P
VWB	Bombay Radio ..	India ..	PG W	WJZ	Newark (T) ..	U.S.A. ...	FX B
			Nav	WKAP	Cranston (T) ..	U.S.A. ...	P B
VWC	Calcutta Radio ..	India ..	PG W T				
			Nav	WKAQ	San Juan ..	Porto Rico	W
VWD	Delhi Radio ..	India ..	FX	WKH	Guntersville ..	U.S.A. ...	FX
VWH	Mhow Radio ..	India ..	FX	WKI	Port Arthur ..	U.S.A. ...	PG
VWJ	Jutogh Radio ..	India ..	FX	WKK	Ceiba ..	Porto Rico	PR
VWK	Karachi Radio ..	India ..	PG W	WLAC	Raleigh (T) ..	U.S.A. ...	P B
			Nav	WLB	Minneapolis WLB T	U.S.A. ...	FX B
VWL	Lahore Radio ..	India ..	FX W	WLD	Ludington ..	U.S.A. ...	PG
			Nav				
VWM	Madras Radio ..	India ..	PG W	WLP	Minneapolis WLP (T)	U.S.A. ...	FX
			Nav	WMW	Manitowoc ..	U.S.A. ...	PG
VWN	Nagpur Radio ..	India ..	FX	WNA	Springfield (T) ..	U.S.A. ...	FX
VWP	Peshawar Radio ..	India ..	FX	WNN	Mobile ..	U.S.A. ...	--
VWQ	Quetta Radio ..	India ..	FX	WNU	New Orleans WNU	U.S.A. ...	PG
VWT	Secunderabad Radio	India ..	FX	WNY	New York WNY ..	U.S.A. ...	PG
VZDB	Naval Staff Office, Port Melbourne	Australia	O				
VZDC	Naval Staff Office, Sydney	Australia	O	WOC	Davenport (T) ..	U.S.A. ...	FX B
				WOD	Beaumont ..	U.S.A. ...	FX
VZDF	Naval Staff Office, Brisbane	Australia	O	WOK	Pine Bluff (T) ..	U.S.A. ...	FX B
				WPA	West Port Arthur ..	U.S.A. ...	PG
VZDG	Naval Staff Office, Adelaide	Australia	O	WPD	Tampa ..	U.S.A. ...	PG
				WPF	Flagship Division I, Camp Eustis (T)	U.S.A. ...	PR
VZDJ	Naval Staff Office, Perth	Australia	O	WPL	St. Croix Falls T ..	U.S.A. ...	FX
				WPR	Ensenada ..	Porto Rico	PG
VZDM	District Naval Office, Hobart	Australia	O				
VZE	King Island Radio	Australia	PG	WQK	S. James ..	U.S.A. ...	PR
VZK	Morobe Radio ..	N. Guinea	PG	WQL	Coram Hill ..	U.S.A. ...	FX
VZO	Manus Radio ..	Adm. Is.	PG	WRM	Urbana (T) ..	U.S.A. ...	FX B
VZR	Kaeweing Radio ..	N. Ireland	PG	WRQ	Marion WRQ ..	U.S.A. ...	FX
VZX	Iatape Radio ..	N. Guinea	PG	WRT	New Brunswick WRT	U.S.A. ...	FX
WAAI	Shock T ..	U.S.A. ...	FX	WSA	East Hampton ..	U.S.A. ...	PG
				WSC	Siasconset WSC ..	U.S.A. ...	PG
WAH	Eldorado (T) ..	U.S.A. ...	FX B	WSE	East Moriches ..	U.S.A. ...	PG
WAR	Warsaw ..	Poland	OFX.W	WSO	Marion WSO ..	U.S.A. ...	PR
WAX	Miami Beach ..	U.S.A. ...	PG	WST	New London ..	U.S.A. ...	PG
WBAK	Harrisburg T ..	U.S.A. ...	FX	WTK	Cleveland ..	U.S.A. ...	PG A
WBAL	Savannah WBAL	U.S.A. ...	PR				W Nav
				WTK	Cleveland WTK ..	U.S.A. ...	PG
WBC	New York WBC ..	U.S.A. ...	PG	WUA	Fort Andrews ..	U.S.A. ...	O
WBF	Boston WBF ..	U.S.A. ...	PG	WUAG	Fort Mills WUAG	Philippine Islands	FX
WBI	Frackville ..	U.S.A. ...	P				
WBU	Chicago WBU (T)	U.S.A. ...	P	WUAH	West Point ..	U.S.A. ...	O
WBW	Burwood ..	U.S.A. ...	PG	WUAI	Fort Ethan Allen ..	U.S.A. ...	FX
				WUAJ	Manila ..	Phil. Is.	O
WBY	Lima T ..	U.S.A. ...	FX	WUAK	Fort Wint ..	Phil. Is.	O
WBZ	Springfield (T) ..	U.S.A. ...	FX B	WUAL	Fort Drum ..	Phil. Is.	O
WCAA	Trale ..	U.S.A. ...	FX	WUB	Fort Hancock ..	U.S.A. ...	O
WCC	Marion WCC ..	U.S.A. ...	PG	WUBA	Camp Alfred Vail ..	U.S.A. ...	FX
WCG	New York WCG ..	U.S.A. ...	PG	WUBB	Camp Grant ..	U.S.A. ...	FX
WCI	Barnegat ..	U.S.A. ...	FX	WUBC	Camp Knox ..	U.S.A. ...	FX
WCJ	Hazleton (T) ..	U.S.A. ...	FX	WUBD	Fort Sill ..	U.S.A. ...	O
				WUBE	Fort Amador ..	Panama	FX
WCO	Negley T ..	U.S.A. ...	FX	WUBV	Key West WUBV	U.S.A. ...	FX
WCY	Cape May WCY ..	U.S.A. ...	PG	WUC	Fort H. G. Wright	U.S.A. ...	O
WDS	Hauto (T) ..	U.S.A. ...	FX	WUCA	Camp Stotsenburg	Phil. Is.	--
WEH	Tulsa (T) ..	U.S.A. ...	FX B	WUCB	Fort John Hay ..	Philippine Islands	--
WEQ	Baltimore (T) ..	U.S.A. ...	FX				
WEK	Frankfort ..	U.S.A. ...	PG	WUCG	Fort De Lesseps ..	Panama	FX
WFO	Houston ..	U.S.A. ...	PG	WUCH	Fort Sherman ..	Panama	FX
WGG	Tuckerton ..	U.S.A. ...	PR	WUCI	Fort Randolph ..	Panama	FX
WGL	Philadelphia WGL (T)	U.S.A. ...	FX B	WUCK	Fort McArthur ..	U.S.A. ...	O
WGW	Vieques ..	Porto Rico	PG	WUCN	Fort Rodman ..	U.S.A. ...	FX
WHA	Madison ..	U.S.A. ...	FX	WUCU	Fort Williams ..	U.S.A. ...	FX
WHE	Philadelphia WHE	U.S.A. ...	PR	WUCV	Fort McKinley ..	U.S.A. ...	O
WHI	New York WHI ..	U.S.A. ...	PR	WUD	Fort Leavenworth	U.S.A. ...	FX
WHT	Rogers (T) ..	U.S.A. ...	PG	WUE	Fort Levett ..	U.S.A. ...	O
WHY	Martinsville T ..	U.S.A. ...	FX	WUF	Fort Monroe ..	U.S.A. ...	O
WII	New Brunswick WII	U.S.A. ...	PR	WUG	Camp Marfa ..	U.S.A. ...	FX

WUH	Fort McIntosh ..	U.S.A. ..	O	WYE	Selfridge Field ..	U.S.A. ..	—
WUI	Fort Riley ..	U.S.A. ..	FX	WYF	Scott Field ..	U.S.A. ..	O
WUJ	Fort Sam Houston ..	U.S.A. ..	O	WYG	Kelly Field ..	U.S.A. ..	O W
WUK	Fort Stevens WUK ..	U.S.A. ..	O	WYH	Rockwell Field ..	U.S.A. ..	O
				WYI	Langin Field ..	U.S.A. ..	O
WUL	Fort Totten ..	U.S.A. ..	O	WYJ	Chanute Field ..	U.S.A. ..	O
WUN	Fort Worden ..	U.S.A. ..	O	WYK	Maxwell ..	U.S.A. ..	FX
WUO	Fort Winfield Scott ..	U.S.A. ..	O	WYP	France Field ..	Panama ..	O
WUP	Anchorage ..	Alaska ..	FX	WYQ	Luke Field ..	Hawaiian ..	O
WUQ	Tientsin ..	China ..	O			Islands ..	
WUR	Fort Morgan WUR ..	U.S.A. ..	O	WYR	Kindley Field ..	Philippine ..	O
						Islands ..	
WUS	Fort Rosecrans ..	U.S.A. ..	O	WYS	Clark Field ..	Philippine ..	O
WUT	Fort Caswell ..	U.S.A. ..	O			Islands ..	
WUV	Livengood ..	Alaska ..	FX	WYT	Camp Nichols ..	Phil. Is. ..	O
WUX	Fort Crockett ..	U.S.A. ..	O				
WUY	Fort San Jacinto ..	U.S.A. ..	O	WZA	Fort Screven ..	U.S.A. ..	O
WUZ	Fort Brown ..	U.S.A. ..	O	WZB	Fort Clark ..	U.S.A. ..	FX
				WZC	Fort Whitman ..	U.S.A. ..	O
WVA	Circle ..	Alaska ..	FX	WZD	Fort Barancas ..	U.S.A. ..	O
WVB	Fairbanks ..	Alaska ..	FX				
WVC	Fort Egbert ..	Alaska ..	FX	WZF	Fort Moultrie ..	U.S.A. ..	O
WVD	Fort Gibbon ..	Alaska ..	FX	WZG	Fort Bragg ..	U.S.A. ..	FX
WVE	S. Michael ..	Alaska ..	PG	WZH	Fort Eads, WZH ..	U.S.A. ..	O
WVF	Ruby WVF ..	Alaska ..	FX	WZI	Fort Ringgold ..	U.S.A. ..	FX
				WZJ	Fort Casey ..	U.S.A. ..	O
WVG	Nome ..	Alaska ..	PG	WZK	Fort Dade ..	U.S.A. ..	O
WVH	Nulato ..	Alaska ..	FX				
WVI	Bethel ..	Alaska ..	PG	WZL	Camp S. D. Little ..	U.S.A. ..	O
WVK	Holy Cross ..	Alaska ..	FX	WZM	Camp Jones ..	U.S.A. ..	FX
WVL	Fort Frank ..	Phil. Is. ..	O	WZN	Fort du Pont ..	U.S.A. ..	O
WVM	Noorvik ..	Alaska ..	PG	WZO	Fort Bliss ..	U.S.A. ..	O
WVN	Fort Mills WVN ..	Phil. Is. ..	O	WZP	Fort Huachuca ..	U.S.A. ..	O
				WZT	Fort Des Moines ..	U.S.A. ..	FX
WVO	Boston WVO ..	U.S.A. ..	O	X	Port Limon ..	Costa ..	P
WVP	Governors Island ..	U.S.A. ..	O			Rica ..	
WVQ	Fort Howard ..	U.S.A. ..	—	XAA	Veracruz de ..	Mexico ..	PG
WVR	Fort McPherson ..	U.S.A. ..	—		Veracruz ..		
WVS	Fort Benj. Harrison ..	U.S.A. ..	—	XAB	Campeche ..	Mexico ..	PG
WVT	Chicago WVT ..	U.S.A. ..	O	XAC	Payo Obispo ..	Mexico ..	PG
				XAD	Alamos de Sonora ..	Mexico ..	PG
WVU	Fort Omaha ..	U.S.A. ..	O	XAE	Mazatlan de Sinoloa ..	Mexico ..	PG
WVV	Jefferson Barracks ..	U.S.A. ..	—	XAF	La Paz de la Baja ..	Mexico ..	PG
WVW	Fort D. A. Russell ..	U.S.A. ..	—				
WVX	Fort Douglas ..	U.S.A. ..	—	XAG	S. Rosalia de la Baja ..	Mexico ..	PG
WVY	S. Francisco WVY ..	U.S.A. ..	—	XAH	Hermosillo ..	Mexico ..	PG
WVZ	Fort Hayes ..	U.S.A. ..	O	XAI	Tuxpan de Veracruz ..	Mexico ..	PG
WWD	Laramie ..	U.S.A. ..	FX	XAJ	Tampico de ..	Mexico ..	PG
					Tamaulipas ..		
WWF	Medicine Bow Peak ..	U.S.A. ..	FX	XAK	Acapulco de ..	Mexico ..	PG
WWJ	Detroit WWJ ..	U.S.A. ..	FX		Guerrero ..		
WWO	Cleveland WWO ..	U.S.A. ..	—	XAL	Puerto Lobos ..	Mexico ..	PG
WWQ	Bellefonte ..	U.S.A. ..	A	XAM	Merida de Yucatan ..	Mexico ..	PG
WWR	Wau ..	Sudan ..	O	XAN	Salina Cruz ..	Mexico ..	PG
WWS	Schenectady ..	U.S.A. ..	FX	XAO	Maria Madre Isld. ..	Mexico ..	PG
WWT	Afognak ..	Alaska ..	O	XNP	Canton ..	China ..	PG
WWU	Newark WWU ..	U.S.A. ..	A				
WWX	Washington WWX ..	U.S.A. ..	—	XOC	Wuchang ..	China ..	O
WWY	Pittsburgh ..	U.S.A. ..	FX	XOF	Chefoo ..	China ..	PG
				XOW	Foehow ..	China ..	PG
WXG	Fort Washington ..	U.S.A. ..	O	XPB	Peking XPB ..	China ..	O
WXJ	Valdez ..	Alaska ..	FX	XQL	Kalgan ..	China ..	O
WXK	Hot Springs ..	Alaska ..	FX	XRT	Tsingtau ..	China ..	PG
WXL	Iditarod ..	Alaska ..	FX				
WXO	Craig ..	Alaska ..	PG	XSG	Woosung ..	China ..	PG
				XSH	Shanghai XSH ..	China ..	PG
WXP	Fort Travis ..	U.S.A. ..	O	XSU	Tsungming ..	China ..	FX
WXV	McGrath ..	Alaska ..	FX	YG	E. Pierre des Corps ..	France ..	FX
WXX	Fort Yukon ..	Alaska ..	FX	YN	Lyon T.S.F. ..	France ..	FX B
WXY	Washington WXY ..	U.S.A. ..	—			Cal. ..	
				2 BD	Aberdeen ..	Gt. Brit. ..	B
WYA	Mitchell Field ..	U.S.A. ..	O	2 LO	London ..	Gt. Brit. ..	B
WYB	Bolling Field ..	U.S.A. ..	O	2 ZY	Manchester ..	Gt. Brit. ..	B
WYC	Langley Field ..	U.S.A. ..	O	5 IT	Birmingham ..	Gt. Brit. ..	B
WY CJ	West Memphis ..	U.S.A. ..	O	5 NO	Newcastle ..	Gt. Brit. ..	B
WYD	Fairfield ..	U.S.A. ..	O	5 SC	Glasgow ..	Gt. Brit. ..	B
WYDA	S. Louis ..	U.S.A. ..	O	5 WA	Cardiff ..	Gt. Brit. ..	B
WYDB	Memphis ..	U.S.A. ..	O	5 WA	Cardiff ..	Gt. Brit. ..	B
WYDC	New Orleans ..	U.S.A. ..	O	6 BM	Bournemouth ..	Gt. Brit. ..	B
	WYDC ..						

AIRCRAFT

Call Sign.	Station.	Country.	Service.	Call Sign.	Station.	Country.	Service.
FADDM	Méditerranée ..	France	PG	GEAWW	GEAWW (T) ..	Gt. Brit.	— ¹
FAIB	A.T. 10 ..	France	PG	GEAWY	GEAWY (T) ..	Gt. Brit.	— ¹
FAIC	A.T. 12 ..	France	PG	GEBBG	GEBBG (T) ..	Gt. Brit.	— ¹
FAID	A.T. 14 ..	France	PG	GEBBH	GEBBH (T) ..	Gt. Brit.	— ¹
FAIL	A.T. 15 ..	France	PG	GEBBI	GEBBI (T) ..	Gt. Brit.	— ¹
FAIQ	A.T. 19 ..	France	PG	GEBBQ	GEBBQ (T) ..	Gt. Brit.	— ¹
FAIU	A.T. 24 ..	France	—	GEBBR	GEBBR (T) ..	Gt. Brit.	— ¹
FAJB	Z.D. 1 ..	France	PG	GEBBS	GEBBS (T) ..	Gt. Brit.	— ¹
FAJD	Z.D. 2 ..	France	PG	GEBBT	GEBBT (T) ..	Gt. Brit.	— ¹
FAJN	Z.D. 3 ..	France	PG	GEBBV	GEBBV (T) ..	Gt. Brit.	— ¹
FAKC	V.Z. 2 ..	France	PG	GEBBW	GEBBW (T) ..	Gt. Brit.	— ¹
FAKD	C.M. 2 ..	France	—	GEBBX	GEBBX (T) ¹ ..	Gt. Brit.	— ¹
FAKH	V.Z. 3 ..	France	PG	GEBBY	GEBBY (T) ..	Gt. Brit.	— ¹
FAKJ	V.Z. 4 ..	France	PG	GEBCX	GEBCX (T) ..	Gt. Brit.	— ¹
FAKM	V.Z. 5 ..	France	PG	ISAAE	M. 1 ..	Italy ..	—
FAKP	V.Z. 8 ..	France	PG	ISAAF	M. 14 ..	Italy ..	—
FAKQ	V.Z. 10 ..	France	PG	ISAAG	F. 6 ..	Italy ..	—
FAKS	V.Z. 11 ..	France	PG	ISAAH	O. 8 ..	Italy ..	—
FAKT	V.Z. 12 ..	France	PG	IXAAA	Angelo Berardi ..	Italy ..	—
FAKU	V.Z. 14 ..	France	PG	IZAAB	M. 18 ..	Italy ..	—
FAKY	V.Z. 17 ..	France	PG	IZAAC	M. 6 ..	Italy ..	—
FAKZ	V.Z. 24 ..	France	—	IZAAD	P.V. 3 ..	Italy ..	—
GEA ²	GEA ² ..	Gt. Brit.	— ²	KFBA	Balboa (T) ..	U.S.A. ..	P
GEAAB	GEAAB (T) ..	Gt. Brit.	— ¹	NERK	Shenandoah ..	U.S.A. ..	O
GEAPJ	GEAPJ (T) ..	Gt. Brit.	— ¹	NERM	Z.R. 3 ..	U.S.A. ..	O
GEASI	GEASI (T) ..	Gt. Brit.	— ¹	PBP ³	Vliegtuigen ..	Holland	—

NOTES.

¹ Correspondence restricted to messages relating to the navigation or safety of the aircraft.

² The general call signal GEA denotes any aircraft of the British Royal Air Force.

³ This call signal applies to any or all of the aeroplanes of the Dutch Royal Navy; it is followed, when necessary, by the letter and number of a particular aeroplane.

DIRECTION-FINDING.

- (A) The Reliability of Radio Direction-Finding for Navigation Purposes.**
- (B) Regulations and Procedure relating to Direction-Finding of the Counties of the World.**

THE RELIABILITY OF RADIO DIRECTION-FINDING FOR NAVIGATION PURPOSES.

R. L. SMITH-ROSE, Ph.D., M.Sc., D.I.C., A.M.I.E.E.

IN the previous edition of this YEAR BOOK, the author reviewed briefly the progress of radio direction-finding since it was first applied in practice. It was there emphasised that each of the three systems which have attained to commercial application is based on the same fundamental principles, this theoretical deduction being now adequately supported by experimental results (1).

It was also indicated that with either system the inherent instrumental error could be reduced to a negligible amount for practical purposes by attention to design, arrangement and construction of the apparatus. By a suitable and careful choice of the site of a proposed direction-finding (D.F.) station, preferably supported by actual measurements made with a portable set, any errors due to the local surroundings could be reduced to a negligible amount or compensated for by a calibration chart. The remaining and most serious errors, however, to which D.F. stations are subject under certain conditions are those which are due to some external influence on the electromagnetic waves during their propagation from transmitter to receiver. These errors are of a variable magnitude and are most serious during the night periods. It appears that the opinions of large numbers of people who are acquainted with radio direction-finding are mainly divided into two classes, viz.: (a) those who assert that all radio bearings are "dead right"; and (b) those who talk familiarly of errors of 90° and upwards during the night periods when they consider direction-finding perfectly hopeless under all conditions. These classes appear to have arisen from two schools of observers—(c) those who "forget" to record all bearings which they know to be incorrect, and (d) those who in the enthusiasm of their search for errors, only record bearings under periods and conditions which are likely to produce large errors in the apparent bearings.

Before any reliance will be placed in the application of radio direction-finding by those concerned with aerial and marine navigation, it is necessary to compile data on as complete and as wide a scale as possible, showing the limits of accuracy of the method in all circumstances, from which may be obtained the times and conditions under which reliance may be placed in D.F. for navigational purposes. It will be useful, therefore, to review our present knowledge of this subject from the particular viewpoint of its utility in connection with navigation, taking as unbiassed a view as possible of all the material at our disposal. It may be said at the outset that such a consideration of the whole matter results in some caution being given to those individuals falling into class (a) above, while at the same time a tone of distinctly cheerful elevation can be extended towards the pessimists in class (b). It should be mentioned here that throughout this article only the method of direction-finding by reception is being considered.

THE DIRECTION-FINDER ON SHIP OR ON SHORE.

Other things being equal, it is fairly obvious that it will be more satisfactory to a navigator to have the apparatus from which his bearing is to be obtained under his direct control on board ship, to be used in much the same manner as compass and sextant are employed. In addition to the satisfaction of taking one's own measurements and the removal of the

suspicion otherwise placed on the reliability of the readings of an unknown observer situated at a distance, the possible error involved in signalling the bearing from the above station to the ship is also removed. With the directional receiver situated on shipboard, observations may be taken at any time, and verified immediately on the same or any other stations that may be transmitting. While it is often claimed that this may always be done without making any transmissions or increasing the existing traffic, in many cases it is necessary to obtain special transmissions for ship working, in view of the uncertain duration and general brevity of traffic on the shipping waves being insufficient for accurate bearing observations. The location of the D.F. set on the ship also permits of bearings being taken on other ships, whose positions can be given, this feature being particularly useful when the ship is out of touch with any shore D.F. station.

As against this arrangement, it may be said that the direction-finder is usually more accurate when used on land than on ship, for not only is a local error due to the ship introduced in the latter case requiring calibration and correction, but the observed bearing is always taken relative to the ship's head, the direction of which must be obtained simultaneously from the compass. Any inherent error of the compass is therefore included in the error of the D.F. set. This improved accuracy of the shore station is particularly advantageous in stormy weather. Another advantage of the shore D.F. system, is that any ship provided with radio transmitting and receiving gear may request and obtain a bearing from the shore station, without the provision or any additional apparatus on board.

In a paper by F. W. Dunmore(2) of the Bureau of Standards, which summarises this question more fully, a practical example is instanced in which a ship could have been saved by response to her distress call if both this and other ships in the vicinity had been provided with D.F. gear.

THE CHOICE OF THE D.F. SYSTEM TO BE EMPLOYED.

This must in part rest with the result of selection from the previous section. At a shore D.F. station which is to keep a continuous watch for ships requesting bearings, a staff of six or eight operators is required, and the initial cost of the station may be largely composed of the cost of buildings for offices and housing of staff rather than of the electrical apparatus and plant. It is also to be remembered that if the D.F. station is provided with transmitting apparatus, this will probably be the same whichever D.F. system is employed, and its cost will prove to be quite equal to if not exceeding that of the D.F. receiving gear. In a land station also, the return on capital as represented by the initial cost of the station, together with an allowance for depreciation may be only a small fraction of the annual expenditure on the station, where a large staff is employed.

It is seen, therefore, that at a land station maintaining a continuous watch, the cost of the D.F. apparatus is relatively unimportant, and the choice of system to be employed must therefore rest upon the technical merits of the system—case of manipulation and accuracy of the readings obtained. In this respect it is probable that the Bellini-Tosi system has the superiority over the other two, for although the circuit arrangement and apparatus are somewhat more complicated, the adjustments are not critical and may be easily carried out by a skilled operator, and the mass of the moving part is relatively small thus permitting of rapidity and accuracy of observation. It may be remarked, however, that with the same detailed attention paid to the design and construction of the apparatus, as has been given to the Bellini-Tosi system during the last ten years, the frame coil, whether of the single or double type, might be in a very much more favourable position for comparison on its technical merits. The portability and relative

cheapness of the frame coil D.F. set, give it distinct advantages for use at a land station where these are not outweighed by other factors.

The last remark may aptly be used in commencing the review of the choice of system, when the direction-finder is to be used on board the ship itself. Confining our attention first to marine navigation the prime question here is cost of the D.F. receiving apparatus with due regard to accuracy, for it is to be viewed merely as an additional apparatus for the use of the navigator. No transmitting gear will be required on a ship already fitted for radio communication and no additional staff will be required if a continuous D.F. watch is unnecessary, the apparatus being used by the ships operator at the comparatively infrequent times required by the navigator. When the D.F. apparatus is on board ship, however, the observed bearings are subject to error resulting from the currents induced in the metal work of the ship by the incoming radio waves. Both the Bellini-Tosi and the Robinson systems are being employed on ships of this country, while the single frame coil is greatly favoured by the American ships. There is naturally considerable discussion between the promoters of the rival systems as to the relative merits and advantages of these, but it must be acknowledged that there are as yet available insufficient detailed results as to the relative effects of the ship's error on the D.F. to make a just comparison.

In a recently published paper by C. E. Horton(3) the use of the Bellini-Tosi system on steel ships was discussed in some detail. In this case it is claimed that the use of large aerial loops results in some smoothing out of the error curve, due to the integration of the secondary fields arising from the currents induced in the metal work of the ship. By decreasing the dimensions of the fore-and-aft loop relative to the thwartships loop, the quadrantal error can be considerably decreased in amplitude, and a final adjustment can be made at the receiver by adding suitable impedance in series with one or both loops. It is claimed that by this means the error curve can be reduced to a maximum value of 2° , which compares favourably with the permanent errors experienced on land and provides an accuracy quite adequate for ordinary navigation purposes.

The exponents of the frame coil system claim that it is usually possible to find somewhere above the ship a small volume of space, large enough to permit of rotation of the loop, in which the secondary fields from the currents in the ship are very small and hence the quadrantal error is small. Extremely little published evidence is available on this point however. The typical ship's-error curves published by Mesny(4) and by Kolster and Dunmore(5) show a maximum value of about 10° , while those given by Ballantine (6) show a maximum of nearly 30° . It is generally admitted to be advantageous to reduce this as much as possible, not only to permit of more accurate correction, but also to eliminate the possibility of variation in the error. The error curve is particularly subject to this variation when it is largely the result of currents flowing in loops formed by stays, etc., the conductivity of which may vary from time to time. The error may be reduced by a suitable disposition of coils about the ship, but this of course adds to the complication of the instrument.

On aeroplanes the choice of system is perhaps more limited, for the loop aeriels employed are usually limited to coils of one or more turns wound over the wings and fuselage of the machine. These coils may then be used on the principle of either of the three systems, but the single coil and Robinson systems involve the necessity of swinging the machine, a feature which is preferably to be avoided in many cases. The loops may be connected up to a goniometer and used on the Bellini-Tosi system without this drawback, and the error due to the machine may be reduced in a similar manner to that used on ships. Alternatively small rotating frame coils may be used

inside the machine for obtaining bearings, and other coils used to obtain compensation for the ships error (7).

VARIABLE ERRORS.

With the provision of a direction-finder either on ship or shore, and a calibration chart for the correction of any errors arising from local conditions, it is now essential to know what magnitude the variable errors are likely to attain under the various conditions to be met with in practice. When this information is fully obtained, deductions may be drawn as to the ranges, and periods of day or night, etc., for which it can be definitely stated that radio bearings will be reliable to some specified accuracy.

Fessenden(8) appears to have been the first to have observed in the years 1901-7, the existence of these variable errors. He found that when receiving over a range of 100 miles, errors of from 20° to 45° occur, these errors being much greater during the night than during the day. In 1919, A. H. Taylor(9) published some D.F. observations taken at Washington, in which the variations range from a few degrees in the daytime up to nearly 90° at night. Using continuous waves of length from 4,000 to 16,700 metres, Taylor notes that in general the variations are greater on the longer than on shorter waves, except where the transmission is over a comparatively short distance. For example, Annapolis observed at Washington at a distance of 35 miles practically overland, showed an extreme variation of 10° , whereas New Brunswick at a distance of 175 miles showed nearly 90° variation. The opinion is expressed in this paper that the variations are not so serious when damped waves are employed, although Brooklyn on a wavelength of 1,500 metres (spark) is stated to give a variation of 30° , this being for a transmission over a distance of about 250 miles, almost entirely over land.

In a paper(10) summarising a great deal of experience in direction finding, Round in 1920 mentions the existence of these variable errors at night, ranging up to 7° on "spark" signals and exceeding 30° for continuous wave signals. Expression is given to the lack of evidence at that time showing any increase in the variation with wavelength, and the discussion on the paper indicates the somewhat hazy state of knowledge upon these variable errors. Further observations were published in 1920 by Kinsley and Sobey(11), who made observations on wavelengths of 960 to 5,700 metres from "spark" stations and 4,900 to 17,300 metres continuous waves. Variations in the apparent bearings ranging up to 50° are recorded for distances of transmission ranging from 40 to 7,500 miles. Their experience indicated that undamped waves of great length show these variable effects much more frequently than damped waves of shorter length. It is to be remembered, however, that the distance of transmission is usually very much greater in the former than in the latter case, and the authors express the view that "there does not seem to be any reason to believe that the short wavelength sparks may not, under favourable conditions, show distortion (*i.e.*, variations) of the same magnitude as those given by other types of transmitters." Other results published in 1921 by Messrs. Ferrié, Jouaust, Mesny and Perot(12) support the view that while in daylight the bearings of fixed stations operating on wavelengths of 2,500 metres and upwards show maximum variations of from 2° to 3° from the mean value, these are greatly exceeded at sunset and during the night periods, when the variations may be as great as 90° .

A paper which is chiefly concerned with the scientific aspect of these variations by T. L. Eckersley(13), contains few actual results but a good summary of general experience is given therein. It is stated that bearings taken in the daytime from about one hour after sunrise until one hour before sunset are fairly constant, but that in the remainder of the 24 hour period, the bearings are subject to variations amounting to more than 40° , the variations being apparently less violent over sea or upon land than over

mountainous country. Some careful observations made by day only by Rothé(14), led him to conclude that no variations in ordinary atmospheric conditions would account for the small variations observed in the daytime. G. W. Pickard(15), in 1922, published further results taken on various American and two European stations, and the author draws attention to the great lack of accumulated data on the subject of these variations which is so necessary for the checking of theories put forward for their explanation. A feature of the results given here is that the bearings on the European stations at Otter Cliffs, Maine, U.S.A., show a much smaller average variation than those on the San Diego station. For example, the *average* variation obtained during the month of August, 1921, of both day and night readings was 2.1° on New Brunswick, 3.8° on Nauen, 4.2° on Bordeaux, 4.3° on Glace Bay and 10.6° on San Diego. The chief feature of the difference in paths of transmissions from San Diego and Europe to Otter Cliffs is that the former is entirely over land, whereas the latter is mostly over sea, except for the grazing incidence of the waves down the Atlantic coast of America.

Records published by Mesny in 1922(16) lead him to express the points that variations only commence when there is transmission for at least 15 miles over land; that short wavelengths of 600-1,000 metres give rise to only small variations, whereas on long waves (10,000-25,000 metres) variable errors ranging up to 90° may occur, these generally being greatest at sunset and less frequently at sunrise. The long waves employed were undamped and the short waves damped, but it is believed that the different effects observed were not due to the damping but to the difference in wavelengths. Mesny also emphasises the need for further observations made under varying conditions.

SUMMARY OF PRESENT KNOWLEDGE ON THE VARIATIONS.

It will be seen from the above brief résumé, that the published information available on this subject is exceedingly scanty, particularly from the viewpoint of its application to navigation. The evidence appears at first sight to be somewhat conflicting but this is chiefly due to the wide variability of conditions under which the observations are made. The nature (whether damped or undamped) and length of the waves employed, the distance of transmission, the nature of the portion of the earth's surface traversed, and the periods of daylight and darkness over the path of the waves are all factors which may affect the magnitude and frequency of the errors observed. It is only by concentrated observation under conditions permitting of the variation of each of these factors in turn that their individual effect can be ascertained. On one or two points the agreement appears to be almost unanimous, viz., that when the transmission is over a distance exceeding about 15 miles, as a conservative estimate, and using a wavelength greater than about 1,500 metres, variations in apparent bearing are observed which are limited to two or three degrees in daylight, but which increase considerably during the hours of darkness. The magnitude of the night variations appears to increase rapidly with the range of transmissions, although the available data on this point is somewhat limited. The observations by Pickard(15), however, on some transatlantic signals appear to indicate that when the transmission is entirely or almost entirely over sea at distances of the order of 2,000 miles, the magnitude of the variation is very much less than when the transmission is over land. The quantity of data based upon observations on shorter wavelengths hitherto published is sadly limited, while as far as the writer is aware, no detailed information has yet been published giving the results of observations made on wavelengths from 450 to 800 metres, which are those most commonly used for ship D.F. in Europe and America. Those who have experienced direction-finding on these wavelengths only generally state that no serious variable errors exist, and this is reflected to some extent by the notes found in the D.F. notices of the various countries that the bearings

given by the shore stations are usually accurate to within 2° , although no guarantee of this is given.

In considering the apparent disagreement of the errors observed on long and short waves, it is to be remembered, firstly, that on short wavelengths the transmitting stations are of low power, seldom exceeding 3 kw., and their range of transmission for D.F. purposes is therefore very limited; secondly, that the great majority of the stations operating on these wavelengths are situated on the coast since they are chiefly concerned with ship communication; thirdly, that the D.F. stations are also situated on the coast, and that the majority of their bearings are taken upon ships, and on other coast stations over open stretches of sea; and lastly, that to check the accuracy of the observed bearing of a ship it must be compared with the calculated or charted bearing obtained from the ship's position, a factor which is very frequently unknown to any accuracy at the time the wireless bearing is requested. The resulting facts that on the shorter waves the bearings are usually taken on waves travelling entirely over sea, and over distances rarely exceeding about 100 miles and frequently less than 50 miles, whereas on the long waves, greater distances and large tracts of land are usually involved, probably account for the impression that the errors are greater on long than on short waves.

Partly with the object of increasing the amount of material data available for the individual who may be interested in the utilitarian aspect of direction finding, the Radio Research Board has been conducting a detailed investigation into these variable errors, over as wide a range as possible, employing wavelengths of from 450 metres upwards and working over distances of from 10 miles over both land and sea. The co-ordination of the large mass of data obtained is now well advanced and the results will be published in due course, but a few general impressions gathered by the author in his conduct of the investigation may here be given as a conclusion to this article.

Using wavelengths ranging from 450 to 6,800 metres both spark and C.W. at distances from 1 to 16 miles, the maximum variations observed over long periods of time on both day and night working, are of the order of 3.5° , this corresponding to a maximum deviation (and \therefore error) of less than 2° . This refers to transmission entirely over land, and in one case over a range of 10 miles some 700 readings have been compiled showing a maximum difference from the mean of 1.7 over about six months, an error which can be associated with the D.F. set and operator. When the distance over land is increased to 40 miles and upwards, while the day variations remain of the same order as above, the night variations increase considerably up to those resulting in a deviation from the mean of about $40'$. At a given distance there is no noticeable difference in the magnitude or frequency of the errors observed on the short wave of 450 metres, and on the longer waves of 2,500-9,000 metres. When the transmission is entirely over sea, however, as from a ship to a shore D.F. station, the minimum distance at which night variations become appreciable is increased to the order of 80-100 miles. In certain experiments made on ships at night, at ranges of 50-80 miles over open sea, and over a period of several months, over 80 per cent. of the bearings obtained were accurate to within 2° and 90 per cent. to within 3° . This error includes all personal and instrumental errors in determining and recording the positions of the ships, which were at all times proceeding at full speed on their normal course. Simultaneous observations made on the same signals at a second D.F. station, situated about 80 miles inland, showed errors up to $30'$. Owing to the difficulty of making the corresponding tests on long waves it can only be said that there is no evidence as yet that the results would be different in any way on longer waves, under precisely the same conditions.

The chief need for the application of D.F. to navigation appears to be in the proximity of land, approaches to harbours, etc., where the distance of

transmission is comparatively short, and it may therefore be stated that when the path of transmission does not involve more than 15 miles over land or 80 miles in all, the D.F. bearings can be given to an accuracy of within 2°, which is amply sufficient for most practical purposes. A reservation must here be made concerning the cases where the transmitter is very close (within one mile) to the D.F. receiver, when the effect of the horizontal portion of the transmitting aerial may become serious. In one test on a wavelength of 450 metres, the error due to this cause at half-a-mile from the transmitter amounted to over 5°.

What is usually required, however, is a position fix from three or preferably four stations, and the probable accuracy of this position can be calculated from the above accuracy of the individual bearings supplied. Since confidence in the use of D.F. for navigation can only be inspired by prolonged experience under all conditions, the need should be emphasised for some co-operation between the responsible authorities for the ships to whom D.F. is most useful on the one hand, and for the D.F. stations on the other, to carry out frequent test observations, which can be checked against the ships' positions obtained by visual or other means. The present method of waiting until a ship is either in danger or seriously delayed by adverse weather conditions before a bearing is requested is unfair to the D.F. stations in giving them insufficient practice, and also does not provide the navigator with the necessary experience of the probable accuracy of the bearing supplied. From the ships' point of view, the chief need is a great increase in the number of the D.F. stations available at various points on the coast, and particularly at the points where a ship is making land from the open sea, and at the entrances to harbours which at present can only be navigated in clear weather.

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LAWS, REGULATIONS AND PROCEDURE RELATING TO DIRECTION FINDING

Note.—Special regulations affecting aircraft for direction and position finding, in addition to those printed below, are contained in the Aviation Section.

THE following is an extract of the Laws, Regulations and Procedure adopted by the various countries of the world and obtained in some instances from publications issued by them, principally *The Admiralty List of Wireless Signals*, the *Nautical Almanac* and the *Radio Service Bulletin* of the Department of Commerce, U.S.A., for which due acknowledgment is hereby made.

Wireless direction-finding stations (W/T D.F.) are either existing wireless telegraph stations or stations especially constructed for the purpose on shore, which are equipped with apparatus enabling them to ascertain the direction from which wireless signals transmitted by other stations emanate, and particularly from ships at sea.

The procedure to be generally adopted varies to some extent with different stations, both regarding the wavelength to be used and the general procedure for requesting and acknowledging bearings. In general, a ship requiring its position calls up a direction-finding station or stations either singly or, as is often the case when one station controls one or more others, collectively, requesting, in the proper procedure laid down, its position. The station or stations called again in proper procedure, reply with the true bearing of the ship from that station. The accuracy of the bearings so obtained depends largely on certain conditions which are outlined below, but generally speaking, they can be considered accurate to within two degrees.

Administrations of the various countries controlling such direction-finding stations accept no responsibility for the consequences of any bearing being inaccurate, but where three direction-finding stations can be employed suitably situated to give intersecting bearings, almost complete reliance can be placed on the results so obtained, provided that the triangle of error ("cocked hat") formed by the intersection of bearings is small.

To obtain the greatest possible degree of accuracy, it is important that the ship station should use low power to transmit. Signals should be fairly strong and clear, and the signal strength be kept steady with strict attention to spacing. Any instructions for procedure given by the countries in which direction-finding stations are situated should be strictly adhered to.

In direction finding there is always a possible ambiguity of 180°. Darkness, fog, stormy weather and coast line errors have also to be taken into account. Nothing should be left to chance when obtaining bearings; every possible precaution should be taken to ensure their accuracy.

It is expected that before long an international agreement will standardise the procedure to be adopted for the requesting and giving of bearings and the wavelengths to be used for such communications. Meanwhile, each country has rules and regulations governing the use of its own direction-finding stations.

There are three systems of direction finding at present operating, viz. :—

- (a) Where each direction-finding station is fitted with transmitting and receiving apparatus and works independently.
- (b) Where several direction-finding stations (usually situated near a harbour entrance or difficult passage) are linked together by special telegraph cables and are controlled by one telegraph station, which alone is fitted with transmitting apparatus. Controlling stations in such cases are usually not direction-finding stations at all, but the ordinary coast stations.

- (c) Where a ship requires a single bearing only. In this case the vessel calls the wireless stations nearest to the direction-finding station, which calculates the bearing, and it is then transmitted by the wireless station.

A large number of ships are now fitted with direction finding apparatus and can obtain their own position by operating on one or more fixed position transmitting stations. In such cases the ship is, of course, independent of shore direction-finding stations and can obtain its position at more or less any point of the globe.

Direction finding is also being considerably developed in regard to aviation particularly with the cross-channel airways. It has, on several occasions, in adverse weather conditions, been exceedingly useful and is getting to be more and more to be relied upon. With aircraft direction finding is usually carried out by means of radiotelephony. The position can normally be given within two minutes. In the case of both ship and air vessels, direction finding should be practised in clear weather, in order that proficiency and reliability may be obtained.

FIXING POSITION BY WIRELESS DIRECTIONAL BEARINGS.

(N.B.—The W, T stations referred to in this article are fictional.)

I.—GENERAL.

Fixing position by directional wireless is very similar to fixing by cross bearing from visible objects, the principal difference being that, when using a chart on Mercator's Projection, true bearings have to be changed into mercatorial bearings, the wireless stations being generally at very much greater distances than the objects used in an ordinary cross bearing fix.

Although fixing position by wireless directional bearings is dependent for its accuracy upon the degree of precision with which it is at present possible to determine the direction of wireless waves, subsequent confirmation of the course and distance made good, by the receipt of additional bearings, would afford confidence to those responsible in the vessel as the land is approached under weather conditions that preclude the employment of other methods.

At the present time, from shore stations with practised operators and instruments in good adjustment, the average error in direction should not exceed 2° for day working, but it is to be noted that errors at night may be larger, although sufficient data on this point is not at present available.

II.—TRACK OF WIRELESS WAVE.

The track of a wireless wave being a great circle is represented on a chart on Mercator's Projection by a flat curve, concave towards the equator; this flat curve is most curved when it runs in an east and west direction, and flattens out as the bearing changes towards north and south. When exactly north and south it is quite flat, and is then a straight line, the meridian. The true bearing of a ship from a W, T station, or *vice versa*, is the angle contained by the great circle passing through either position and its respective meridian.

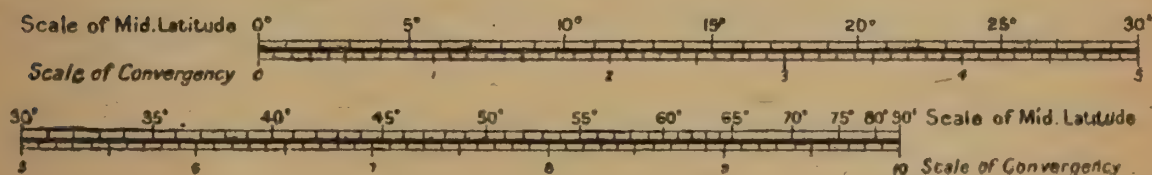
III.—CONVERGENCY.

Meridians on the earth's surface not being parallel but converging towards the poles, it follows that a great circle will intersect meridians as it crosses them at a varying angle. The difference in the angles formed by the intersection of a great circle with two meridians (*i.e.*, convergency) depends on the angle the great circle makes with the meridian, its middle latitude between the meridians, and the difference of longitude between the meridians.

This difference is known as the convergency, and can be approximately calculated from the formula:—

Convergency in mins. = diff. long. in minutes $\times \sin$ mid. lat.

Scales for obtaining the Convergency for 10' Diff. Longitude in different Latitudes



Example:— Mid Lat. $50^\circ 30'$, diff. long. 282; To find the Convergency.
Under $50^\circ 30'$ on Mid. Lat. scale read 7.7 on scale of Convergency
which multiplied by 28.2 gives 217' the Convergency

Fig. 1.

Convergency may be readily found from the Convergency Scales (Fig. 1) or it may be found by traverse table entering the D. long. as distance and mid lat. as course; the resulting departure being the convergency in minutes.

IV.—TRUE AND MERCATORIAL BEARINGS.

Meridians on a Mercator's chart being represented by parallel lines, it follows that the *true bearing* of the ship from the station, or *vice versa*, cannot be represented by a straight line joining the two positions, the straight line joining them being the *mean mercatorial bearing* which differs from the true bearing by $\pm \frac{1}{2}$ the convergency. As it is this mean mercatorial bearing which we require, all that is necessary when the true bearing is obtained from a W/T station is to add to or subtract from it $\frac{1}{2}$ the convergency and lay off this bearing from the station.

V.—SIGN OF THE $\frac{1}{2}$ CONVERGENCY.

Provided the bearings are always measured in degrees North 000° to 359° (clockwise) the sign of this $\frac{1}{2}$ convergency can be simply determined as follows:—

N. lat. ... $\frac{1}{2}$ convergency is + to the bearing given by the W/T station when ship is E. of station.

N. lat. ... $\frac{1}{2}$ convergency is - to the bearing given by the W/T station when ship is W. of station.

S. lat. ... The opposite.

When the W/T station and the ship are on opposite sides of the equator, the factor \sin mid. lat. is necessarily very small and the convergency is then negligible. All great circles in the neighbourhood of the equator appear on the chart as straight lines, and the convergency correction as described above is immaterial and unnecessary.

VI.—EXAMPLE.

A ship is by D.R. in lat. $48^\circ 45' N.$, long. $25^\circ 30' W.$, and obtains wireless bearings from Sea View $244\frac{1}{2}^\circ$, and from Ushant $277\frac{1}{2}^\circ$. What is her position?

Sea View	Lat. $55^\circ 22' N.$	Long. $7^\circ 19\frac{1}{2}' W.$
D. R.	„ $48^\circ 45' N.$	„ $25^\circ 30' W.$

Mid. lat. $52^\circ 03' N.$ Diff. long. $1090.5'$

Convergency $= 1090.5' \times \sin 52^\circ = 859'$
or $\frac{1}{2}$ convergency $= 7^\circ 09'$

The true bearing signalled by Sea View was $244\frac{1}{2}^\circ$, as ship is west of the station (North lat. see paragraph V.), the $\frac{1}{2}$ convergency will be "minus" to the true bearing signalled.

Therefore the mercatorial bearing will be $237\frac{1}{2}^\circ$ nearly.

Similarly with Ushant.

Lat. D. R.	$48^\circ 45' N.$	Long. $25^\circ 30' W.$
„ Ushant.	$48^\circ 26\frac{1}{2}' N.$	„ $5^\circ 05\frac{1}{2}' W.$

Mid. lat. $48^\circ 36' N.$ Diff. long. $1224.5'$

Convergency $1224.5' \times \sin 48^\circ 36' = 919'$
or $\frac{1}{2}$ convergency $= 7^\circ 40'$

The true bearing signalled by Ushant was $277\frac{1}{2}^\circ$, as ship is west of the station (North lat. see paragraph V.); the $\frac{1}{2}$ convergency will be "minus" to the true bearing signalled. Therefore the mercatorial bearing will be 270° nearly.

Laying off $237\frac{1}{2}^\circ$ and 270° on the chart from Sea View and Ushant respectively the intersection will be in:

Lat. $48^\circ 27\frac{1}{2}' N.$, long. $25^\circ 05' W.$, which is the ship's position.

Note.—In plotting the positions the largest scale chart available that embraces the area should be used. A station pointer will be found convenient for laying off the bearings where the distances are great.

The chartlet (Fig. 2), drawn on the Mercator's Projection shows the above positions and the error involved by laying off the true bearings as signalled from Sea View W/T and Ushant W/T.

The solid lines are the great circles passing through Sea View and ship's position and Ushant and ship's position.

The pecked lines are the true bearings laid off as signalled, their intersection (B) being in lat. $50^\circ 14' N.$, long. $25^\circ 46' W.$, or approximately $110'$ from the correct position.

The dotted lines are the mean mercatorial bearings laid off from Sea View and Ushant and their intersection (C) gives the ship's position very nearly *i.e.*, lat. $48^\circ 27\frac{1}{2}' N.$, long. $25^\circ 05' W.$

Position A is the ship's D.R. position, lat. $48^\circ 45' N.$, long. $25^\circ 30' W.$, which was used for calculating the $\frac{1}{2}$ convergency.

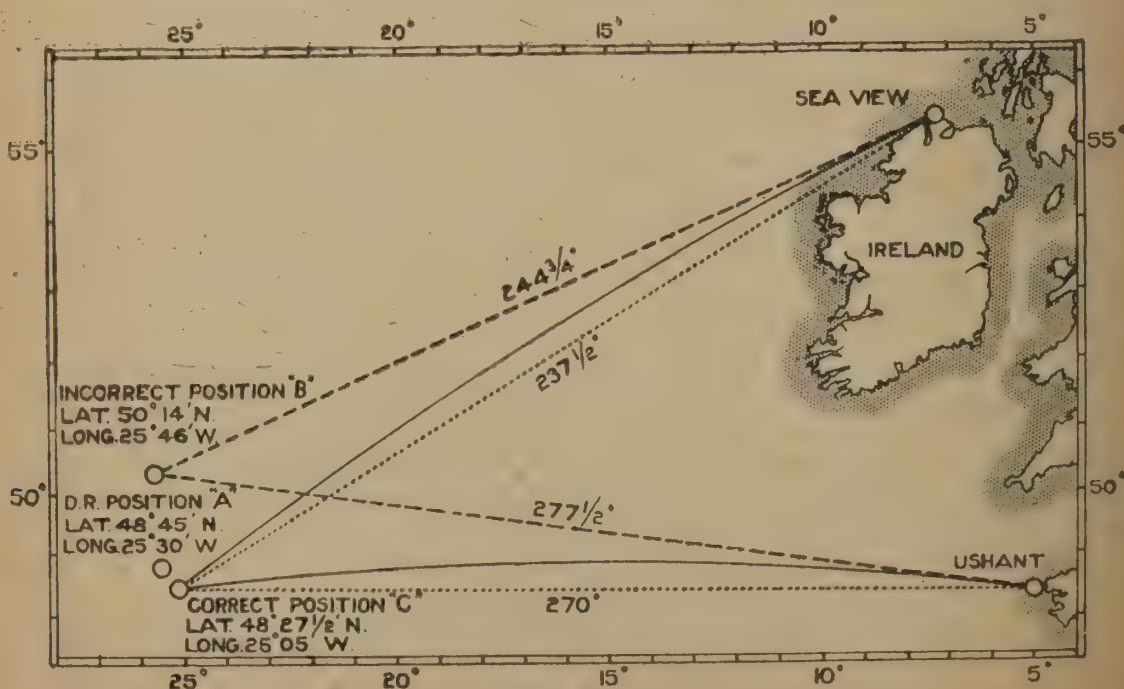


Fig. 2.

Note.—As the true position of the ship should have been used to obtain the $\frac{1}{2}$ convergency the quantity found is not correct, but it could be recalculated using lat. and long. (c) and a more correct value found. This, however, is only necessary if the error in the ship's assumed position is very great.

VII.—ACCURACY OF THIS METHOD OF PLOTTING.

Although this method is not rigidly accurate, it can be used for all practical purposes up to 1,000 miles range, and a very close approximation found to the position lines upon which the ship is at the moment the stations receive her signals.

VIII.—USE OF W/T BEARINGS WITH OBSERVATIONS OF HEAVENLY BODIES.

It follows that W/T bearings may be used in conjunction with position lines obtained from

observations of heavenly bodies, the position lines from the latter being laid off as straight lines (although in this case also they are not strictly so), due consideration being given to the possible error of the W/T bearings. Moreover, W/T bearings can be made use of at short distances as "position lines," in a similar manner to the so-called "Summer line" when approaching port, making the land, avoiding dangers, etc.

IX.—CONVERSE METHOD.

When ships are fitted with apparatus by which they record the wireless bearings of shore stations whose positions are known, the same procedure for laying off bearings from the shore stations can be adopted, but it is to be remembered that in applying the $\frac{1}{2}$ convergency to these bearings it must be applied to the converse way, in both hemispheres, to that laid down in paragraph V.

CANADA

Direction finding wireless stations are maintained by the Dominion Government as in the following Table I.

TABLE I.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles).
CANADA (Nova Scotia)	Chebucto Head	VAV	44 30 01	63 31 20	800	250
	Canso	VAX	45 19 24	60 58 25	800	100
CANADA (New Brunswick)	St. John	VAR	45 15 04	66 00 47	800*	250
NEWFOUNDLAND	Cape Race	VAZ	46 39 10	53 05 05	800	250

* After communication has been established on 600 metres.

These are of the Bellini-Tosi type, stationary aerial. All bearings are given on the 800 metre wave. For the present no charge is made for bearings supplied.

1. A ship wishing to obtain her bearings should call the D.F. station required on 800 metres, except St. John, as noted above, and transmit the signal QTE? using commercial procedure as follows:—

EXAMPLE.

Ship (call sign CHR) calls up station required (call sign VAV):—

— • • • — VAV VAV VAV — • • • CHR
CHR CHR QTE. • • • — • • • — • • •

The D.F. station on acknowledging the receipt of the signal QTE? will say whether it is ready to take the bearing at once, or whether the ship is required to wait.

If the D.F. station is ready to take the bearing, it will make:—

CHR R QTE VAV — • • —

2. On receiving this acknowledgement of the signal QTE? and the signal — • • — (go) the ship will make: — • • • — • • • — etc. (• • • — repeated 30 times) • • • — • • • CHR.

3. If the D.F. station is not satisfied with the bearing it will make • • • — • • • to the ship, which will repeat • • • — 20 times (as above); otherwise the D.F. station does not answer until the bearing has been worked out, when the station will immediately call the ship and transmit the TRUE bearing of the ship from the station in degrees from 000° to 359°, in Government message form, all angles being measured clockwise from true North (000°).

4. Should a ship be within range of and wish to obtain her bearings from more than one D.F. station, she should, if possible, call up the individual stations required, and carry out the

above procedure simultaneously with all stations in order to avoid undue interference.

5. Well tuned, clear signals, of medium or fair strength, are essential for accurate direction finding. The D.F. station will, if necessary, direct the ship to increase or decrease power so that signals are not stronger than desirable. Care must be taken to keep the note and strength of signals steady, and pay proper attention to spacing. The sharper the tuning, the more accurate will be the bearing; therefore, coupling should be as loose as possible, consistent with the required strength of signals.

6. It must be understood that D.F. station bearings are susceptible to errors at night, and also when the bearing lies roughly along the coast line.

Under normal conditions errors are not likely to exceed 2°.

If conditions are such that the error may exceed 1°, then the bearing will be given as approximate, this being noted by the suffix "app" to the bearing, e.g., "App 148 degrees." The error in these approximate bearings is not likely to exceed 4°, and will generally not exceed 2½°.

Ships should note that a D.F. station cannot distinguish between the bearing of the ship and its reciprocal, unless the reciprocal bears inland. In the case of doubt, the station will give the ship the two possible angles from true North the decision being left to the ship as to which is her correct bearing. When two angles are given they will not necessarily differ by the theoretical 180°, since there may be deviation corrections applied by the D.F. station, which vary slightly at opposite points of the compass.

7. With a view to checking up the work of D.F. stations, a record of the actual positions of a ship at the time a bearing has been obtained will be of the greatest assistance to the department, and if the circumstances are such that the ship's officers can determine fairly accurately by back reckoning or otherwise, such position a brief report should be forwarded to the Canadian Government Wireless Inspector at the nearest Canadian port at the first opportunity, containing:—

- (a) Name of ship.
- (b) Name of D.F. station.
- (c) Date and G.M.T. at which bearing was given.
- (d) Bearing given by D.F. station.
- (e) Estimated position or bearing of ship at above time and date by methods other than D.F. bearings.
- (f) The probable degree of accuracy of the above-mentioned estimated bearing or position.

(g) Weather conditions at above time.

(h) Remarks, if any.

(i) Signature of Master or responsible Navigating Officer.

Forms for this purpose may be obtained upon request from the:

Deputy Minister, Department of the Naval Service, Ottawa, or from the Government Wireless Inspectors at:—

H.M.C. Dockyard, Halifax.

Old Custom House, 1, Common Street, Montreal (during summer).

Old Post Office Building, St. John, N.B. (during winter).

8. The operator must not ask for a bearing except when instructed to do so by the master of the vessel.

9. No charge will be made by the Canadian Government for the above service until further notice.

FRANCE AND ALGERIA

Acts and decrees affecting direction finding are to be found under France and Algeria in the Laws and Regulations Section. (Pages 234-248 and page 494).

TABLE II.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude	Wave-length (metres)	Range (miles).
FRANCE (Channel and Bay of Biscay)	Guiparas	FEG	48 27 00	1 25 00 E.	450** 800	120
	Bernières	FEB	49 20 00	0 25 00 W.	450** 800	120
	Cherbourg	FUC	49 36 32	1 36 00 W.	450** 800	200
	Tréguier—St. Gonery	FET	48 50 13	3 13 56 W.	450** 800	120
	***Ouessant—Pen ar Roch.	FEO	48 26 30	5 05 40 W.	450** 800	200
	††Brest—La Trinité ..	FEX	48 21 53	4 35 18 W.	2,100 (C.W.)	
	†****Brest—Moulin du Seigneur	FEI	48 19 36	4 33 14 W.	450** 800	300
	Pointe du Raz	FER	48 02 20	4 43 52 W.	450** 800	120
	†Penmarc'h	FEP	47 48 30	4 21 01 W.	450** 800	120
	Lorient	FUN	47 44 05	3 20 45 W.	450** 800	300
	†St. Nazaire—Ville-es- Martin	FEZ	47 15 24	2 13 49 W.	450** 800	120
	Rochefort—Soubise ..	FES	45 56 00	1 00 00 W.	450** 800	120
TUNISIA	Bizerta—Seti Meriem	FEQ	*37 14 42	*9 50 03 E.	450** 800	—
ALGERIA	Jijelli	FEJ	36 49 10	5 46 12 E.	450** 800	200
FRANCE (Mediterranean)	Toulon—La Mitre ..	FEM	43 06 11	5 55 37 E.	800	300
MOROCCO	Qnitra (Kenitra) ..	CNK	*34 18 49	*6 36 00 W.		
	Casablanca—Chetaba	CNP	33 35 21	7 34 10 W.	800	300
FRENCH INDO-CHINA	Kien an	FKA	*20 47 00	*106 37 00 E.	600	150
	Kak Ba	FCB	*20 44 00	*107 02 05 E.	600	80

† Station closed until further notice.

* Connected to Brest—Mengam W/T (FUE) (lat. 48° 20' 52" N., long. 4° 35' 20" W.) which will provisionally employ a wavelength of 2,400 metres (C.W.) for replying to requests for bearings and transmitting results. Bearings on a wavelength of 2,100 metres (C.W.) are obtained by first calling Mengam on 2,400 metres (C.W.).

** In exceptional cases a wavelength of 600 metres can be used.

*** Transmitting station: Ouessant (FFU).

**** Transmitting station: Brest—Mengam (FUE).

* Position approximate.

* Bearings are transmitted by Toulon—Mourillon (FUT) on 600 metres wave.

Note.—These stations work in conjunction with each other.

* Position approximate.

A.—LOW POWER W/T D.F. STATIONS.

1. French low power W/T D.F. stations keep watch on a wavelength of 600 metres (damped), which must be used for calling up ships desirous of obtaining their bearings.

The D.F. station called replies on the same wave.

The bearing wave (*i.e.*, the wave on which the ship transmits the signal permitting the station to make the observation for the bearing) is either 800 metres or 450 metres, at the option of the ship. The wavelength of 600 metres can be used by ships which cannot transmit either on 450 or 800 metres.

The result of the observation is transmitted by the D.F. station on the same wavelength. Toulon and Casablanca, however, always transmit the result on 800 metres, whatever the bearing wave may be.

2. The abbreviations used are:—

QTE? = What is my true bearing relatively to you (or to)?

QTE = Your true bearing relatively to me (or to) is

The bearings are indicated by a number consisting of three figures. They are reckoned from 000 to 359 clockwise, thus: North = 000° West = 270°.

3. A ship desires to obtain bearings from a single station or simultaneously from several stations.

The procedure to be observed is as follows:—

(a) The ship calls the station (or stations) on the 600 metre wave, and transmits the signal "QTE?" followed by the call signals of all the stations from which he requires observations, and a number indicating the wavelength to be used. She then listens on 633 metres.

(b) The D.F. stations called prepare to take the bearings, and, when ready, reply in the alphabetical order of their call signals, directing the ship by the signal K to commence transmission; this signal is followed by a figure giving the intensity of the signal (scale = 1 to 9) to be made by the ship.

(c) On receiving the signal K the ship adjusts her transmitting gear accordingly, and sends her own call signal for 50 seconds. She then listens on the same wave.

(d) The station, replying in the alphabetical order of their call signals, give the results of their observations by the signal QTE followed by a group of three figures indicating the bearing; or may, if necessary, ask the ship to repeat the preceding message.

EXAMPLE.

A ship ABC requires bearings from the D.F. stations Brest—Moulin du Seigneur (FEI) and Ouessant—Pen-ar-Roch (FEO), on a wavelength of 450 metres.

The various operations are effected in the following order:

(a) ABC calls on 600 metres the two stations:

VE FEI FEI FEO FEO V ABC QTE?
FEI FEO 450 AR.

ABC having transmitted this signal listens on 600 metres.

(b) FEI replies on 600 metres:

VE ABC V FEI 450 K 6

FEO replies on 600 metres:

VE ABC V FEO 450 K 7

(c) FEI and FEO adjust their receiving apparatus to 450 metres.

ABC also adjusts her receiving apparatus to 450 metres, and signals:—

VE FEI FEO V ABC ABC ABC. . . . (for 50 seconds) AR

ABC then listens on 450 metres.

(d) Both shore stations having made the necessary observations, find that at 1545 G.M.T. (civil):

FEI 330° FEO 010°

FEI thereupon signals on 450 metres:

VE ABC V FEI 1 BT 1545 QTE 330 AR
FEI

ABC acknowledges receipt by making:

VE FEI V ABC R II VA

FEO then signals on 450 metres:

VE ABC V FEO 3 BT 1545 QTE 010
AR FEO

ABC acknowledges receipt by making:

VE FEO V ABC R II VA

All stations concerned after repeating VA resume their normal service.

NOTE.—(1) The figure 1 and 3 before the signal BT give the registered number of the bearing on the station register; 1545 refers to the civil mean time of the meridian of Greenwich (the first two figures representing the hours, and the last two the minutes).

(2) If one of the stations (*e.g.*, FEO) desires to repeat the message the bearing not having been made correctly at the first transmission, it makes the signal:

VE ABC V FEO UD

The ship again repeats her call signal for 50 seconds as in (c); the remaining portion of the message is then sent as stated.

B.—HIGH POWER W/T D.F. STATIONS.

The procedure to follow for obtaining bearings is analogous to that indicated for low power stations.

The wavelength for watchkeeping and for the bearing are the same; *viz.*, 2,100 metres (continuous wave).

If the D.F. station is connected to a W/T station keeping permanent watch on 2,400 metres (C.W.), a ship can ask for the bearing on 2,100 metres (C.W.) by applying to the D.F. station on 2,400 metres (C.W.) (*e.g.*, Brest—La Trinité W/T D.F. is connected to Brest—Mengam W/T).

In this case the wavelength of 2,400 metres (C.W.) is used for calling only; and the wavelength of 2,100 metres (C.W.) is used for all the signals that follow.

CHARGE.—A charge of six francs is made for each bearing.

CAUTION.—When the bearing between the ship and the D.F. station is parallel, or nearly so, with the general trend of the coast, its accuracy cannot be relied on. The error under such conditions may be as large as 10°. It is necessary therefore, to warn ships against the use of D.F. bearings, when the angle between the line of bearing and the coast is less than 20°. If, however, circumstances necessitate the acceptance of a bearing under these conditions, the amount of possible error must always be taken into account.

NOTE.—The French Government decline all responsibility so far as the accuracy of the bearings transmitted is concerned.

GERMANY

Radio compass stations belong to the State Marine, but are also available for public use.

For the radio direction finding service there are, on the German coasts, the radio direction-finding stations of Borkum F.R.A., Nordholz F.R.A., List F.R.A., Stolpmünde F.R.A., and Warnemünde F.R.A., which are supported by the directional indications of the wireless stations of Borkum F.S., Nordholz F.S., List F.S., Stolpmünde F.S., Warnemünde F.S., and Wilhelmshaven III, Einfahrt F.S. The directional indications are given free of charge. Further installations of this kind will, it is anticipated, be erected at Cuxhaven and Norddeich. The radio directional stations of Stolpmünde F.R.A. and Warnemünde F.R.A., are used for naval service traffic only. Further particulars as to the geographical position, etc., are to be found in the following table.

TABLE III.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude E.	Wave-length (metres)	Range (miles).
GERMANY	§Wilhelmshaven (3rd entrance)	KAN	53 31 16	8 09 33	600	-
	Borkum	KBO	53 34 51	6 41 42	600*	300
	Nordholz	KBQ	53 47 06	8 38 27	600*	300
	List	KAO	55 00 12	8 23 12	600*	300
	Warnemünde	KBY	54 10 39	12 00 56	800	
	Stolpmünde	KAY	54 34 37	16 50 06		

§ Control Station.

* Normal wavelength, 800 metres.

When a ship is desirous of determining her position in the North-Sea it calls Wilhelmshaven (KAN), according to the International Regulations, on the 600 metres wave, and requests from it either:—

The individual bearing of the D.F. stations so that she may fix her position, or

Her position from KAN as determined by wireless bearings.

The signals employed are:—

QTE=What is my true wireless bearing?
Your true bearing is degrees.

QTF=What is my ship's position by wireless bearing?

Ship's position is .

KAN thereupon signals the ship concerned to wait, and, on another wave, requests the D.F. stations to give the bearings. As soon as the latter are ready, KAN requests the ship to send VVVs. This the ship does for one minute (first of all transposing the transmitter to the 800 metres wave), frequently interspersing the signal with her own call signal.

When Send VVVs is signalled for the first time, and the bearing fails to reach the D.F. station, the latter replies "No bearing."—In this case the vessel is ordered to repeat. This signal need not last longer than a minute. After VVVs have been sent, the transmitter should be altered back to 600 metres.

Bearings are reckoned true from the D.F. station concerned. Errors in the individual bearings may amount to 2°. From bad tuning, indifferent transmission and other causes, errors may sometimes be increased. Bearings running nearly in the direction of the coast line are subject

to greater variation, as also are those passing alternately over water and land. When intermittent fog occurs, fog banks lying in the line of bearing can occasion divergence, and thereby give rise to corresponding errors in the bearings.

Large ships are recommended generally to use example (a), as in fixing the ship's position on board, any errors in the individual bearings are more easily recognised and can be adjusted.

Example (b) is intended mainly for smaller vessels on which in heavy seas accurate plotting on the chart is attended with difficulty.

As a third case it may happen that a vessel only obtains a single bearing from one D.F. station; in this case she calls up the nearest station (see under example (c)).

For ships which are unable to alter the transmitter to the 800 metres wave, it is possible for bearings to be given on 600 metres. In this case the signal "QSY 600" should be added to the signal "QTE?" or "QTF?" when asking for bearings; for method see under example (d). It should be observed, however, that, judging from experience, the 600 metres wave does not give such good results as the 800 metres.

EXAMPLES.

Wilhelmshaven control station call signal—KAN.

S.S. "Kleist" call signal—DST

Borkum W/T—KBM

Nordholz W/T—KBM

List W/T—KAL

Borkum W/T D.F.—KBO

Nordholz W/T D.F.—KBQ

List W/T D.F.—KAO

(a) S.S. "Kleist" requires bearings from each of the three D.F. stations (on 800 metres wave).

1015 (600 m.) — • — • — KAN KAN
KAN DE DST — • — • —

1016 (600 m.) — • — • — DST DST DST
DE KAN — • — • — K

1016 (600 m.) — • — • — KAN DE DST
— • — • — QTE — • — • —

1017 (600 m.) — • — • — DST DE KAN
VE EB

1017 Call to the D.F. stations on another wave: "Bearing β DST λ 600 m."

1018 (600 m.) — • — • — DST DE KAN
— • — • — Please send VVVs 800 m.

— • — • —
1018 (800 m.) — • — • — KAN DE DST
— • — • — VVVs, etc. DST — • — • —

(The call signal of the ship must be frequently interspersed in the VVs. sent.)

(1020-1022. The stations transmit the results on a different wave to KAN.)

1023 (600 m.) — • — • — DST DE KAN
— • — • — QTE 1018 β KBO x° β KBQ y° ,

β KAO z° VEUD — • — • — K

1024 (600 m.) — • — • — KAN DE DST
VE VE — • — • — SK

1024 (600 m.) — • — • — DST DE KAN
VE VE SK

(1025 Advice from the stations on completion of the bearing.)

NOTE.—Communication between KAN and the D.F. stations is carried on on a different wave, so as not to interfere with the messages on 600 metres.

(b) S.S. "Kleist" requires her position by wireless bearing (in 800 metre wave).

The method employed is similar to (a), except that the ship asks for "QTF?" not "QTE?" and obtains her position by latitude and longitude.

(c) The ship (DST) requires only a single bearing from a D.F. station (on 800 metres wave). She calls the W/T station belonging to the W/T D.F. station concerned, with which she exchanges signals. The bearing in this case also is reckoned from the D.F. station.

1030 (600 m.) — • — • — KBM KBM
KBM DE DST — • — • —

1031 (600 m.) — • — • — DST DST DST
DE KBM — • — • — K

1031 (600 m.) — • — • — KBM DE DST
— • — • — QTE — • — • —

1032 (600 m.) — • — • — DST DE KBM
— • — • — Please send VVs 800 m.

— • — • —
1032 (800 m.) — • — • — KBM DE DST
— • — • — VVs, etc. DST — • — • —

(The call signal of the ship must be frequently interspersed with the Vs sent.)

1034 (600 m.) — • — • — DST DE KBM
— • — • — QTE 1032 x° — • — • — K

1035 (600 m.) — • — • — KBM DE DST
VE VE — • — • — SK

1035 (600 m.) — • — • — DST DE KBM
VE SK

(d) The ship (DST) requires only a single bearing from a D.F. station, but cannot employ the 800 metres wave.

1030 (600 m.) — • — • — KBM KBM
KBM DE DST — • — • —

1031 (600 m.) — • — • — DST DST DST
DE KBM — • — • — K

1031 (600 m.) — • — • — KBM DE DST
— • — • — QTE — • — • — QSY 60.

— • — • —
1032 (600 m.) — • — • — DST DE KBM
— • — • — Please send VVs 600 m.

— • — • —
1032 (600 m.) — • — • — KBM DE DST
— • — • — VVV etc. DST — • — • —

(The call signal of the ship must be frequently interspersed with the Vs.)

1034 (600 m.) — • — • — DST DE KBM
— • — • — QTE 1032 x° — • — • — K

1035 (600 m.) — • — • — KBM DE DST
VE VE — • — • — SK

1035 (600 m.) — • — • — DST DE KBM
VE SK

REMARKS.—Should bearings of the ship's position be required through the three D.F. stations on the 600 metres wave according to examples (a) and (b), the procedure should be as above. In these cases the Control stations signals the D.F. stations as follows:—

Bearing β DST λ 600 m.

NOTE.—Mid-European time is used, the hours and minutes being expressed in four figures from 0000 to 2359.

GREAT BRITAIN*

Acts and laws affecting direction finding are to be found under Great Britain in the Laws and Regulations Section.

TABLE IV.

Country.	W/T Station.	Call Signal.	Latitude N.	Longitude W.	Wave-length (metres)	Range (miles).
GREAT BRITAIN	Lizard	BVY	49 59 07	5 12 27	450	—
	Berwick	BVG	55 41 46	1 53 43	450	—
	Flamborough	BVN	54 06 50	0 04 56	450	—
	Orfordness	BXH	52 05 46	1 32 56	450	—
AIRCRAFT STATIONS.						
	Croydon	GED	51 21 10	0 07 40 Longitude E.	900	—
	Pulham	GEP	52 24 15	1 14 25	900	—

All D.F. stations keep watch *and take bearings* on the 450 metres wave; the use of any other wave is strongly to be deprecated. They work as independent stations and can transmit, as well as receive, on 450 metres.

Ships with Marconi apparatus can adjust their transmitting gear very nearly to this wave (using reduced power) by cutting out half the primary transmitting condenser and adjusting the A.T.I. till the earth lamp shows maximum current in the aerial. The primary slider should be "all in."

The actual procedure to be adopted by ships requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave, bearings should be asked for separately. If on the other hand the stations to be called all keep watch on the same wave, they should be called up together and the bearings taken in one operation. If, however, two or more stations are linked by special land line, only one of them should be called up. In such cases, however, the ship must specify in the preliminary signal the D.F. stations which are required to supply bearings.

The following signals are to be used:—

Signal.	Meaning.
QTE?	"What is my true bearing from you (or from)?"
QTE	"Your true bearing from me (or from) was degrees."

(a) The ship calls the station or stations on the appropriate wave, making "QTE?" in conjunction, if necessary, with the call signals of the stations from which bearings are required and also (if the call is *not* made on 450 metres by the figures "450," signifying that the ship will shift to 450 metres for the taking of the bearing. The ship then awaits instructions.

EXAMPLE 1.

Simultaneous Bearings from two D.F. stations.

(b) A ship whose call signal is XYZ requires bearings from D.F. stations BXV and BZW (connected by land line).

The ship, having first shifted to 450 metres, calls BXV thus:—

CT BXV BXV DE XYZ QTE BXV BZW?

She then awaits instructions.

BXV thereupon warns BZW by land line, and, when both are ready, makes on 450 metres:—

CT XYZ DE BXV K.

The ship (XYZ) makes on 450 metres:—

CT BXV DE XYZ XYZ XYZ, etc. (for 60 seconds).

BZW is not satisfied with the bearing and informs BXV. BXV makes on 450 metres:—

CT XYZ DE BXV?

The ship at once complies by making on 450 metres:—

CT BXV DE XYZ XYZ XYZ, etc. (for 60 seconds).

BZW is then satisfied that the bearing is 340° degrees and informs BXV, while BXV finds that its own result is 37°. BXV therefore makes on 450 metres:—

CT XYZ XYZ DE BXV 1 9.45 M (time)
= QTE BZW 340 BXV 037 + BXV.

EXAMPLE 2.

Bearing by Non-transmitting D.F. Station.

(c) The ship (XYZ) requires a bearing from D.F. station BXX, which does not transmit. The ship has to use 600 metres to call GMH, a W/T station which is linked up by land line to BXX.

She calls on 600 metres, thus:—

CT GMH GMH DE XYZ QTE BXX? 450

She then gets ready to shift to 450 metres and awaits instructions.

GMH thereupon warns BXX by land line and then makes on 600 metres:—

CT XYZ DE GMH 450 K.

GMH then shifts to 450 metres so as to be ready to give the result when received by wire from BXX.

On receiving "K," the ship, having shifted transmitting wave to 450 metres (if not already done), then makes:—

CT GMH DE XYZ XYZ XYZ, etc. (for 60 seconds).

BXX gets a satisfactory bearing of 329° and informs GMH. The latter makes on 450 metres:

CT XYZ XYZ DE GMH 2 10.46 S (time)
= QTE BXX 329 + GMH.

EXAMPLE 3.

Bearing from Single D.F. Station.

(d) Had the ship (XYZ) merely asked BXY for a bearing, BXY, finding it to be 246°, would make on 450 metres:—

CT XYZ XYZ DE BXY 1 7.6 M (time)
= QTE 246 + BXY.

Note.

(e) The D.F. station (or stations) called always replies (in alphabetical order if more than one) either asking the ship to repeat (?) or giving the result. The result is given by the signal QTE followed as necessary by the call signal and by a group of *three* figures (000 to 359) indicating the bearing from 000° to 359° of the ship *from* the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time (civil) for all messages giving bearings to merchant ships.

(f) In order to confirm to the D.F. station that the message has been received correctly, the ship on receiving the result will repeat back the message. The station will then acknowledge or repeat if necessary, and when satisfied that the ship has received the message correctly will make the "end of work" sign. This sign is then repeated by the station or stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

(g) The stations are operated by the Admiralty, but are available for the use of the Mercantile Marine.

A charge of five shillings (5s.) will be made for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

The accuracy with which bearings can be taken depends on certain conditions already referred to, but although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given, from any failure in the service, or from any other cause whatever.

(Notice No. 952 of 1920.)

AIR- MINISTRY NOTICE TO AIRMEN.

No. 103, DATED SEPTEMBER 30TH, 1920.

ROYAL NAVY WIRELESS DIRECTION FINDING STATIONS.

It is hereby notified :—

1. Aircraft may use the Wireless Direction Finding Stations operated by the Royal Navy, under the conditions laid down for the use of these stations by the Mercantile Marine, in Admiralty "Notice to Mariners," No. 524, of March 25th, 1920.

2. The actual procedure to be adopted by aircraft requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (e.g., Lizard and Carnsore), they should be called up together, and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (e.g., Amlwch and Rhyl) only one of them should be called up. In such cases, however, the aircraft must specify in the preliminary signal the D.F. stations which are required to supply bearings.

3. The following abbreviations are to be used :—

Signal.	Meaning.
QTE ?	"What is my true bearing from you (or from —) ?"
QTE	"Your true bearing from me (or from —) was — degree."

4. The aircraft calls the station or stations, on the appropriate wave, making "QTE ?" in conjunction, if necessary, with the call signals of the stations from which bearings are required; and also (if the call is NOT made on 450 metres) by the figures "450," signifying that the aircraft will shift to 450 metres for the taking of the bearing. The aircraft then awaits instructions.

EXAMPLE 1.

An aircraft whose call signal is XYZ requires bearings from Amlwch (BXV) and Rhyl (BZW).

The aircraft, having first shifted to 450 metres, calls Amlwch thus :—

CT BXV BXV de XYZ QTE BXV BZW ?

The aircraft then awaits instructions.

EXAMPLE 2.

The aircraft requires a bearing from Seaview (BXK). The aircraft has to use 600 metres to call Malin Head (GMH).

The aircraft calls on 600 metres, thus :—

CT GMH GMH de XYZ QTE BXK ? 450

The aircraft then gets ready to shift to 450 metres and awaits instructions.

5. The station or stations called then make the necessary arrangements, and, when ready, answer in alphabetical order of their call signals (if more than one was originally called), and make "K" (go on) preceded by "450" if 450 had been made in the original call.

EXAMPLE 1.

Amlwch, in Example 1 above, warns Rhyl by land line, and, when both are ready, makes on 450 metres :—

CT XYZ de BXV K.

EXAMPLE 2.

Malin Head, in Example 2 above, warns Seaview by land line and then makes on 600 metres :—

CT XYZ de GMH 450 K.

Malin Head then shifts to 450 metres, so as to be ready to give the result when received by wire from Seaview

6 On receiving "K," the aircraft, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 45 seconds, and awaits the result.

EXAMPLE 1

The aircraft, in Example 1, para 4, makes on 450 metres:—

CT BXV de XYZ XYZ CYZ, etc, (for 45 seconds) XYZ.

EXAMPLE 2.

The same as Example 1, reading GMH for BXV.

7. The station or stations then reply (in alphabetical order if more than one) either asking the aircraft to repeat (?) or giving the result. The result is given by the signal QTE followed, as necessary, by the call signal and by a group of three figures (000 to 359) indicating the true bearing from 0° to 359° of the aircraft from the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing it is always expressed in Greenwich mean time for all messages giving bearings to aircraft.

EXAMPLE 1.

Rhyl, in Example 1 above, is not satisfied with the bearing and informs Amlwch. Amlwch makes on 450 metres:—

CT XYZ de BXV?

The aircraft at once complies by making on 450 metres:—

CT XYZ de XYZ XYZ XYZ, etc. (for 45 seconds) XYZ.

Rhyl is then satisfied that the bearing is 340° and informs Amlwch, while Amlwch finds that its own result is 37°. Amlwch therefore makes on 450 metres:—

CT XYZ XYZ de BXV 1 9.45 M (time)
=QTE BZW 340 BXV 037+BXV.

EXAMPLE 2.

Seaview, in Example 1 above, gets a satisfactory bearing of 329° and informs Malin Head. The latter makes on 450 metres:—

CT XYZ XYZ de GMH 2 10.46 S (time)
=QTW BXK 329+GMH.

EXAMPLE 3.

Had the aircraft merely asked Lizard (BVY) for a bearing, Lizard, finding it to be 246° would make on 450 metres:—

CT XYZ XYZ de BVY 1 7.6 M (time)
=QTE 246+BVY.

8. The aircraft, on receiving the result, acknowledges receipt in the ordinary way, and makes the "end of work" sign. This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

9. Further information on this subject is contained in Admiralty "Notices to Mariners," Nos. 363 of February 25th, 1920; 524, of March 25th, 1920, and 838 of May 22nd, 1920, which should be consulted.

By Command of the Air Council,

W. F. NICHOLSON.

Air Ministry, London, W.C.2,

September 30th, 1920.

ITALY

TABLE V.

Country.	W/T Station.	Call Signal	Latitude. N.	Longitude E.	Wave-length (metres)	Range (miles).
ITALY	Murano	IRM	45 27 40	12 21 22	600	—

* The station cannot answer the calls from ships, but is in direct communication by telegraph with the Carbonera W/T station (ICZ).

Vessels wishing to obtain bearings from Murano D.F. station must call up Carbonera (Venice) W/T station, and the latter, having obtained the required information, will duly transmit it to them. The bearings are true, and are given in degrees from 000° to 359°.

The procedure is as follows:—

A ship whose call signal is ABC wishes a bearing.

On a wave of 600 metres she will signal:—

CT ICZ ICZ de ABC QTE?

The D.F. control station will answer:—

CT ABC de ICZ AS.

The control station then wires the D.F. station, and when ready replies:—

CT ABC de ICZ K 6.

ABC after 30 seconds, signals:—

CT ICZ de ABC ABC ABC, etc., for 45 seconds.

If dissatisfied with the bearing, the D.F. station, through the control station, will ask the ship to repeat.

Control station signals:—

CT ABC de ICZ UD.

ABC repeats the signal as given above.

When satisfied with the bearing (which in the case of Murano is assumed to be 170°, at 9.45),

the D.F. station will wire it to the control station, whence it is passed to the ship as follows:—

CT ABC de ICZ de IRM 9.45 M BT QTE
170 AR ICZ.

ABC acknowledges receipt:—

CT ICZ de ABC R SK.

A charge of six francs is made for each bearing transmitted by an Italian W/T D.F. station. The charges are collected in the same manner as for wireless telegrams originating from ships.

NEWFOUNDLAND AND LABRADOR

(See under CANADA)

NORWAY

FIVE Norwegian coast stations, as in the table below, are equipped with direction finding apparatus of the Marconi type. Two of them will, in the near future, be opened for official use at Utsire and Röst. The wavelength to be employed is 600 metres.

Two radio-beacons are in course of construction, one at Marstenen (the entrance to the port of Bergen), and one at Faerder (the entrance of the Kristiania Fjord). The wavelength to be used is 1,000 metres.

TABLE VI.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude E.	length (metres)	Range (miles).
			° ' "	° ' "		
NORWAY	Utsire	L GK	59 18 10	4 55 08	—	—
	Bergen	L GN	60 24 30	5 22 00	—	—
	Röst	L FR	67 30 24	12 04 45	—	—
	Ingöy	L EI	71 04 25	24 09 20	—	—
	Spitzbergen	L FG	78 02 26	14 14 27	—	—

SWEDEN

TABLE VII.

Country.	W/T Station.	Call Signal.	Latitude. N.	Longitude E.	Wave-length (metres)	Range (miles).
			° ' "	° ' "		
SWEDEN	Vinga	SAL	57 38 03	11 36 02	600	100
	Hallö	SAM	58 20 08	11 13 00	600	150

REGULATIONS FOR W/T D.F. STATIONS IN SWEDEN.

Vinga and Hallö D.F. stations are not equipped with transmitting apparatus, but are controlled by Göteborg station (Lat. 57° 40' 44" N., Long. 11° 54' 00" E., call signal SAB, wavelength 600 metres).

Vessels which require bearings from Vinga and/or Hallö should first call up Göteborg. When the latter replies the vessels should signal:—

QTE? = What is the vessels true bearing from ———?
followed by the call signal of the station (for stations) from which the bearing is required.

The vessel waits for the signal K (—●—), and then sends for 50 secs. her own call signal and the signal V (●●●—) alternately, made slowly with the signals prolonged.

Göteborg replies:—

QTE = The true bearing of our vessel from ——— is ——— degrees.

This is followed by a group of four figures, which gives in degrees and tenths the bearing of the vessel from the D.F. station (000.0 = True North; 270.0 = West).

On receipt of this message the vessel repeats the group of figures and makes the "end of work" signal. This is repeated by Göteborg.

Example —

A vessel, call signal SGL, requires bearings from Vinga (SAL) and Hallö (SAM) D.F. stations.

Göteborg W.T. station (SAB) is first called.
 — • • • — SAB SAB SAB DE SGL SGL
 SGL — • • • —

— • • • — SGL SGL SGL DE SAB SAB
 SAB — • • —

— • • • — SAB DE SGL — • • • —
 QTE — • • — SAL SAM — • • • —

— • • • — SGL DE SAB — • • —

— • • • — SGL SGL — • • • —
 — • • — SGL SGL — • • • —

— • • — etc. (for 50 secs.) — • • —
 — • • — SGL — • • —

(Given slowly with prolonged signals.)

— • • • — SGL DE SAB — • • • —
 QTE SAL 2925 SAM 2030 — • • • — SAB
 — • • • —

— • • • — SAB DE SGL — • • • —
 SAL 2925 SAM 2030 — • • • — SGL
 — • • • —

— • • • — SGL DE SAB — • • — SAB
 — • • • —

A charge of 5 Kronor is made for each bearing.

The bearings are as a rule reliable, and the error does not exceed 2° of arc. Under certain conditions bearings may be inaccurate, and this is especially the case when the direction of the vessel in relation to the D.F. station is parallel, or approximately parallel, to the coast; or when the bearing crosses alternately land and

sea. Experience, however, shows that bearings from Vinga across Denmark are ordinarily reliable for bearings of 270° or more.

Unless circumstances are in every way favourable mariners should not rely exclusively on the D.F. bearings, but combine them with the ordinary navigational methods of determining the ship's position.

Errors in bearings of 180° arise because the D.F. station cannot always tell on which side of the station the vessel is situated. As the correction applied by the station to the bearings is not constant, mariners should, when the bearing transmitted is apparently incorrect, refrain from employing a correction of 180° (+ or — as the case may be), but should demand a new bearing instead.

Every precaution is taken to ensure the accuracy of the bearings, but the Swedish Government do not accept responsibility for damage of any sort caused either directly or indirectly through erroneous bearings.

In order that the work of the D.F. stations may be checked, vessels are requested to send a brief account containing the following particulars to Kungl. Telegrafstyrelsens Radiobyra (The Telegraph Service Wireless Bureau), Stockholm, 2:—

- (a) Name of vessel.
- (b) Name of D.F. station.
- (c) Date and time (G.M.T.) of bearing.
- (d) Bearing given from D.F. station.
- (e) Position of vessel at the time (by other means than D.F.).
- (f) Probable accuracy of the calculated position.
- (g) Meteorological conditions.

UNITED STATES OF AMERICA

Acts and laws affecting direction finding are to be found under U.S.A. in the Laws and Regulations Section. (Pages 456 to 483).

THE most recent and probably the most valuable aids to navigation in a fog are the radio compass stations.

While the use of these radio bearings should not lead a mariner to neglect other precautions, such as the use of the lead, etc., during a fog, these bearings will greatly reduce the dangers to navigation for mariners who are compelled for any reason to proceed during foggy or misty weather.

These radio compass stations are provided primarily to assist the mariner in closing the land during fog or poor visibility, but they may also be used to obtain the positions of vessels at sea in radio compass range, about 150 miles, when for any reason positions cannot be obtained by other means.

The maximum distance for which bearings from these stations are accurate is 150 miles. But accurate positions cannot be plotted when more than 50 miles from the shore on Mercator charts, for the Mercator projection introduces a distortion of the true bearing. Charts based on the Gnomonic projection are essential to plot correctly long-distance radio bearings.

Such charts are now under construction by the Hydrographic Office ; until they are available mariners may use the Mercator chart for long distance bearings, applying necessary corrections which may be obtained by various methods, one of which is fully explained on the backs of H. O. Pilot Charts of the North Atlantic Ocean for February, 1921 ; North Pacific Ocean for May, 1921 ; Indian Ocean for June, 1921 ; and Central American Waters, for March, 1921.

Radio Compass Stations are divided into two classes :

(a) Single stations, operating independently, and furnishing a single bearing. These stations are located with the view of giving service to ships at a distance of not over 150 miles from the station.

(b) Harbour entrance groups. All stations in harbour entrance groups are connected to and controlled by the master station ; all stations of the group take bearings simultaneously and these bearings are transmitted to the ship requesting them by the control station. The purpose of these stations is to lead mariners to the light vessels off harbour entrances.

Where only one radio compass station is available, the mariner may fix his position by two or more bearings from the station with the distance run between, or may use the bearing as a line of position, or as a danger bearing. Or the bearing may be crossed with a line of position obtained from an observation of an astronomical body to establish a fix.

The following instructions have been issued by the United States Naval Communication Service concerning the W/T D.F. stations maintained by them :—

The U.S. Naval Communication Service will furnish bearings to all vessels equipped with W/T transmitters.

Wavelengths.—All independent and group D.F. stations keep watch on 800 metres. Only this wave should be used to call and work with the stations.

Calling a W/T D.F. station.—To obtain a bearing from independent stations, call the station from which the bearing is desired in the usual manner and request bearings by means of the conventional signal given below. Simultaneous bearings from two or more stations can be obtained by making the call include the other stations desired.

To obtain bearings from the harbour entrance stations carry out the procedure previously given. The Control Station only will answer.

Conventional signals.—The following signals will be used :—

Signal.	Meaning.
QTE ?	What is my true bearing ?
QTE	Your true bearing is degrees from D.F. station.

Where two or more D.F. stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station, the call signal being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the D.F. stations under its control.

DETAILS.

(a) A ship calling the D.F. station or D.F. Control Station should make the abbreviation "QTE ?" This request will be answered by the station or Control Station, and when ready to observe the bearing it will send the signal "K," indicating to the ship to repeat its distinguishing signal for a period of 50 seconds. The signal should be made slowly with the dashes considerably prolonged.

(b) The testing should be made on 800 metres, upon the completion of which the ship should await reply from the D.F. station.

(c) The station or Control Station will then reply, repeating the signal "QTE," followed by the bearing in degrees given by a group of three figures 000 to 359, indicating the true bearing in degrees of the ship station from the D.F. station, and then the time group giving the time of observations in local Standard Time. In the case of more than one D.F. station connected by land line only, the station originally called will answer. The station will combine all the bearings taken by itself and associated station into one message, which gives each bearing observed immediately after the name of the station making the observation.

All D.F. stations transmit on 800 metres

EXAMPLE.

A ship (call letters KVA) desires to get bearings from the Delaware Bay entrance group (call used :—

— • • • — NSD NSD NSD — • • KVA
KVA KVA — • • • — QTE • • • — • • AR
— • • • — KVA — • • • • NSD K.
— • • • — NSD — • • • • KVA
— • • • — QTE • • • — • • KVA KVA
KVA (making call letters for KVA for 50 seconds
prolonging the dashes) — • • • — KVA AR
— • • • — KVA — • • • • NSD
— • • • — QTE

Cape May 120 Cape Henlopen 110 Bethany
Beach 085 at 0126 — • • • — NSD AR

— • • • — NSD — • • • • KVA
— • • • — 120 110 085 at 0126 • • • — • •
AR
— • • • — KVA — • • • • NSD R
• • • — NSD

This method is the only authorised procedure for obtaining the bearings and should be followed exactly. Such signals as MO — V — and other test signals are not authorised for D.F. work. The testing period of 50 seconds should not be exceeded.

Mariners who do not follow the prescribed procedure exactly occasion delay to themselves in obtaining bearings, and to others who may be waiting for an opportunity to use the stations.

The following information is furnished by the Director of the U.S. Naval Communication Service:—

"The reliance that can be placed in bearings furnished by shore D.F. stations will be governed by the following conditions:—

(a) When two sets of bearings are received which do not agree, a third set should immediately be requested.

(b) In thick weather bearings should be requested at least every half hour.

(c) Bearings that pass over intervening land or that are tangent to the shore line are not as reliable as those that have a clear sweep over the sea.

(d) Navigators receiving a set of bearings should immediately investigate the approximate fix indicated, and determine whether or not they are being furnished with bearings from the stations that should be most reliable.

(e) When the position of the ship as indicated by the D.F. bearing differs materially from the position by dead reckoning, a second set of D.F. bearings should be requested in order to check the first D.F. position."

When a single bearing is furnished there is a possibility of an error of approximately 180° , as the operator at the D.F. station cannot always determine on which side of his station the vessel lies. Certain stations, particularly those on islands or extending capes, are equipped to transmit two corrected true bearings for any observation. Such bearings, when furnished vessels, may differ considerably from 180° from each other, and whichever bearing is suitable should be used. Mariners should, therefore, never attempt to correct a bearing furnished by a station, by the application of the 180° correction, as such correction does not take into account the deviation at the D.F. station, which may be of different sign and unequal amount in opposite directions. The error introduced by the use of 180° correction may amount to as much as 030° . Vessels receiving bearings requiring approximately 180° correction should request the reciprocal bearing from the D.F. station, in case the same is not sent.

Subject to the foregoing, bearings should be accurate within 002° of arc. When bearings from three or more stations are not over 002° of arc in error, but do not meet at a fixed point, the geometrical centre of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

Cautionary Note.—The Director, U.S. Naval Communications, states that considerable difficulty is being experienced with merchant ships asking for W/T D.F. bearings on very broad tunes, and that "bearings obtained by W/T should be accurate within 002° , provided that the transmitting equipment on board vessels is tuned sharply to 800 metres. W/T operators are cautioned to use sufficiently wide coupling to obtain low decrement. If W/T transmitters are not tuned sharply it is difficult to obtain bearings that are sufficiently accurate for navigational purposes."

Masters of vessels are advised to use the W/T D.F. stations frequently, particularly in clear weather, and when the vessel's position is definitely fixed, in order that the degree of accuracy and dependability of the W/T compass may be established.

Note.—While the U.S. Navy Department states that at the present time D.F. bearings have reached a high degree of accuracy, it must be understood that the U.S. Government incur no liability for any consequences resulting from any inaccuracy in the taking or transmission of D.F. bearings. These bearings are provided free of charge, as aids to navigation, to be used at the discretion of the master of the vessel.

Reports.—In order that the operation of the D.F. stations may be checked, mariners obtaining bearings are requested to forward a brief report to the Director, Naval Communications, Navy Department, Washington, D.C., U.S.A., containing the following particulars:—

1. Name of ship.
2. Name of D.F. station.
3. Date and local Standard time at which D.F. bearing was taken.
4. Bearing given by D.F. station.
5. Estimated position of ship at above time and dates by methods other than W/T.
6. The probable degree of accuracy of the estimated position.
7. Weather conditions at above time.
8. Remarks, if any.
9. Signature of master or responsible navigating officer.

There is no charge for bearings furnished by the U.S. Naval W/T D.F. Stations.

Masters of vessels are invited to make use of the U.S. naval radio compass (direction finding) stations to fix positions. They will be found especially useful during thick weather.

The following U.S. naval shore radio compass stations are now in operation for the purpose of furnishing bearings in the Western Atlantic and the Gulf of Mexico. For the present there will be no charge for bearings furnished.

TABLE VIII.
RADIO COMPASS STATIONS ON ATLANTIC AND PACIFIC COASTS, ALPHABETICALLY
BY NAMES OF STATIONS.

[Wavelength of 800 metres for all compass stations.]

ATLANTIC COAST.

Station.	Call.	Position.	Arc of Calibration (True).
Anacostia, D. C.	NSF	Lat. 38° 51' 26" N., long. 77° 00' 56" W.	—
Bar Harbour (Otter Cliffs), Me	NBD	Lat. 44° 18' 36" N., long. 68° 11' 27" W.	—
Bethany Beach, Del.	NSD	Lat. 38° 32' 45" N., long. 75° 03' 22" W.	—
Cape Elizabeth (Portland), Me	NAB	Lat. 43° 33' 59" N., long. 70° 11' 59" W.	—
Cape Hatteras, N. C.	NDW	Lat. 35° 14' 22" N., long. 75° 31' 42" W.	—
Cape Henlopen, Del.	NSD	Lat. 38° 47' 35" N., long. 75° 05' 26" W.	—
Cape Lookout, N. C.	NAN	Lat. 34° 36' 11" N., long. 76° 32' 18" W.	—
Cape May, N. J.	NSD	Lat. 38° 55' 53" N., long. 74° 54' 35" W.	—
Deer Island, Mass.	NAD	Lat. 42° 21' 15" N., long. 70° 57' 30" W.	—
Fire Island, N. Y.	NAH	Lat. 40° 38' 07" N., long. 73° 12' 32" W.	—
Folly Island, S. C.	NZV	Lat. 32° 41' 00" N., long. 79° 53' 23" W.	—
Fourth Cliff, Mass.	NAD	Lat. 42° 09' 40" N., long. 70° 42' 22" W.	—
Gloucester, Mass.	NAD	Lat. 42° 35' 19" N., long. 70° 41' 08" W.	—
Hog Island, Va.	NCZ	Lat. 37° 22' 36" N., long. 75° 42' 37" W.	—
Jupiter, Fla.	NAQ	Lat. 26° 56' 59" N., long. 80° 04' 57" W.	—
Key West, Fla.	NAR	Lat. 24° 33' 08" N., long. 81° 45' 18" W.	—
Lakehurst, N. J.	NEL	Lat. 40° 02' 15" N., long. 74° 20' 13" W.	—
Manasquan, N. J.	NAH	Lat. 40° 07' 05" N., long. 74° 01' 58" W.	—
North Island, S. C.	NZW	Lat. 33° 13' 18" N., long. 79° 11' 10" W.	—
North Truro, Mass.	NAE	Lat. 42° 02' 23" N., long. 70° 03' 37" W.	—
Pensacola, Fla.	NAS	Lat. 30° 20' 46" N., long. 87° 16' 51" W.	—
Port Eade, La.	NBX	Lat. 29° 00' 43" N., long. 89° 09' 32" W.	—
Poyners Hill, N. C.	NCZ	Lat. 36° 17' 16" N., long. 75° 47' 48" W.	—
Prices Neck, R. I.	NAF	Lat. 41° 27' 01" N., long. 71° 20' 16" W.	—
Sandy Hook, N. J.	NAH	Lat. 40° 27' 54" N., long. 73° 59' 50" W.	—
South Pass, La.	NBX	Lat. 29° 00' 43" N., long. 89° 09' 32" W.	—
Surfside (Nantucket), Mass.	NBS	Lat. 41° 14' 39" N., long. 70° 05' 53" W.	—
Tybee Island, Ga.	NEV	Lat. 32° 00' 58" N., long. 80° 50' 27" W.	—
Virginia Beach, Va.	NCZ	Lat. 36° 51' 10" N., long. 75° 58' 33" W.	—

PACIFIC COAST.

† Bird Island, Calif.	NLD	Lat. 37° 49' 27" N., long. 122° 32' 12" W.	120°-305°
Cape Hinchinbrook, Alaska	NRM	Lat. 60° 14' 00" N., long. 146° 38' 54" W.	112°-294°
Cattle Point, Wash.	NFN	Lat. 48° 27' 04" N., long. 122° 57' 45" W.	130°-275°
Empire, Oreg.	NPF	Lat. 43° 23' 03" N., long. 124° 18' 58" W.	230°-000°
Eureka, Calif.	NPW	Lat. 40° 41' 48" N., long. 124° 16' 34" W.	180°-005°
† Farallon Islands, Calif.	NPI	Lat. 37° 41' 58" N., long. 122° 59' 56" W.	000°-359°
Fort Stevens, Oreg.	NZS	Lat. 46° 11' 32" N., long. 123° 59' 15" W.	185°-295°
Imperial Beach, Calif.	NPL	Lat. 32° 35' 14" N., long. 117° 07' 54" W.	182°-331°
New Dungeness, Wash.	NFT	Lat. 48° 10' 36" N., long. 123° 07' 51" W.	255°-095°
Ocean Park, Wash.	NZS	Lat. 46° 27' 53" N., long. 124° 03' 16" W.	205°-315°
Point Arguello, Calif.	NPK	Lat. 34° 34' 43" N., long. 120° 38' 51" W.	170°-000°
Point Fermin, Calif.	NPX	Lat. 33° 42' 19" N., long. 118° 17' 38" W.	090°-200°
Point Hueneme, Calif.	NMD	Lat. 34° 08' 43" N., long. 119° 12' 30" W.	135°-305°
Point Loma, Calif.	NPL	Lat. 32° 42' 21" N., long. 117° 15' 17" W.	185°-350°
† Point Montara, Calif.	NLH	Lat. 37° 32' 02" N., long. 122° 31' 07" W.	173°-352°
† Point Reyes, Calif.	NLG	Lat. 38° 02' 13" N., long. 122° 59' 36" W.	120°-002°
Smith Island, Wash.	NFH	Lat. 48° 19' 04" N., long. 122° 50' 39" W.	000°-359°
Soapstone Point, Alaska	NUW	Lat. 58° 06' 13" N., long. 136° 29' 51" W.	253°-050°
Tatoosh, Wash.	NPD	Lat. 48° 23' 41" N., long. 124° 44' 13" W.	230°-090°

GREAT LAKES.

Detour Point, Mich.	NZU	Lat. 45° 57' 20" N., long. 83° 54' 54" W.	—
Grand Marais, Mich.	NZT	Lat. 46° 40' 29" N., long. 85° 58' 26" W.	—
Whitefish Point, Mich.	NZT	Lat. 46° 46' 19" N., long. 84° 57' 22" W.	—

(NOTE.—The bearings shown in the "Arc of Calibration" column are only reliable in the arc or which the D.F. station has been calibrated. The arc of calibration is the sector of the circle of which the compass coil at the D.F. station is the centre, and the bearings are observed from the fixed position of the station.)

TABLE IX.

RADIO COMPASS STATIONS ON ATLANTIC AND PACIFIC COASTS, ALPHABETICALLY
BY CALL SIGNALS.

ATLANTIC COAST.

Call.	Station.	Call.	Station.
NAB	Cape Elizabeth (Portland), Me.	NBX	Port Eade, La.
NAD	Deer Island, Mass.	NBX	South Pass, La.
NAD	Fourth Cliff, Mass.	NCZ	Hog Island, Va.
NAD	Gloucester, Mass.	NCZ	Poyners Hill, N. C.
NAE	North Truro, Mass.	NCZ	Virginia Beach, Va.
NAF	Prices Neck, R. I.	NDW	Cape Hatteras, N. C.
NAH	Sandy Hook, N. J.	NEL	Lakehurst, N. J.
NAH	Fire Island, N. Y.	NEV	Tybee Island, Ga.
NAH	Manasquan, N. J.	NSD	Cape May, N. J.
NAN	Cape Lookout, N. C.	NSD	Cape Henlopen, Del.
NAQ	Jupiter, Fla.	NSD	Bethany Beach, Del.
NAR	Key West, Fla.	NSF	Anacostia, D. C.
NAS	Pensacola, Fla.	NZV	Folly Island, S. C.
NBD	Bar Harbour (Otter Cliffs), Me.	NZW	North Island, S. C.
NBS	Surfside (Nantucket), Mass.		

PACIFIC COAST.

NFH	Smith Island, Wash.	NPK	Point Arguella, Calif.
NFN	Cattle Point, Wash.	NPL	Imperial Beach, Calif.
NFT	New Dungeness, Wash.	NPL	Point Loma, Calif.
NLD	Bird Island, Calif.	NPW	Eureka, Calif.
NLG	Point Reyes, Calif.	NPX	Point Fermin, Calif.
NLH	Point Montara, Calif.	NRM	Cape Hinchbrook, Alaska.
NMD	Point Hueneme, Calif.	NUW	Soapstone Point, Alaska.
NPD	Tatoosh, Wash.	NZS	Fort Stevens, Oreg.
NPF	Empire, Oreg.	NZS	Ocean Park, Wash.
NPI	Farallon Islands, Calif.		

GREAT LAKES.

NZU	Detour Point, Mich.	NZT	Whitefish Point, Mich.
NZT	Grand Marais, Mich.		

Stations marked † are under the control of Farallon I. W.T. D.F. station, but for the present will continue to handle bearings independently as well as a co-ordinated group. Masters of ships are informed that in making use of the San Francisco Harbour entrance group they are requested to call NPI, which will obtain bearings from the remaining stations in the group and furnish them to the ship after corrections have been applied.

Otherwise the regulations for obtaining bearings are the same as on page 605 (*q.v.*).

Masters of ships are informed that in making use of the San Francisco Harbour entrance group they are requested to call the Farallon Island Station, who will obtain bearings from

the remaining stations in the group and furnish them to the ship, after corrections have been applied.

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| 2. Direction Finding | 6. Private |
| 3. Official | 7. Aviation |
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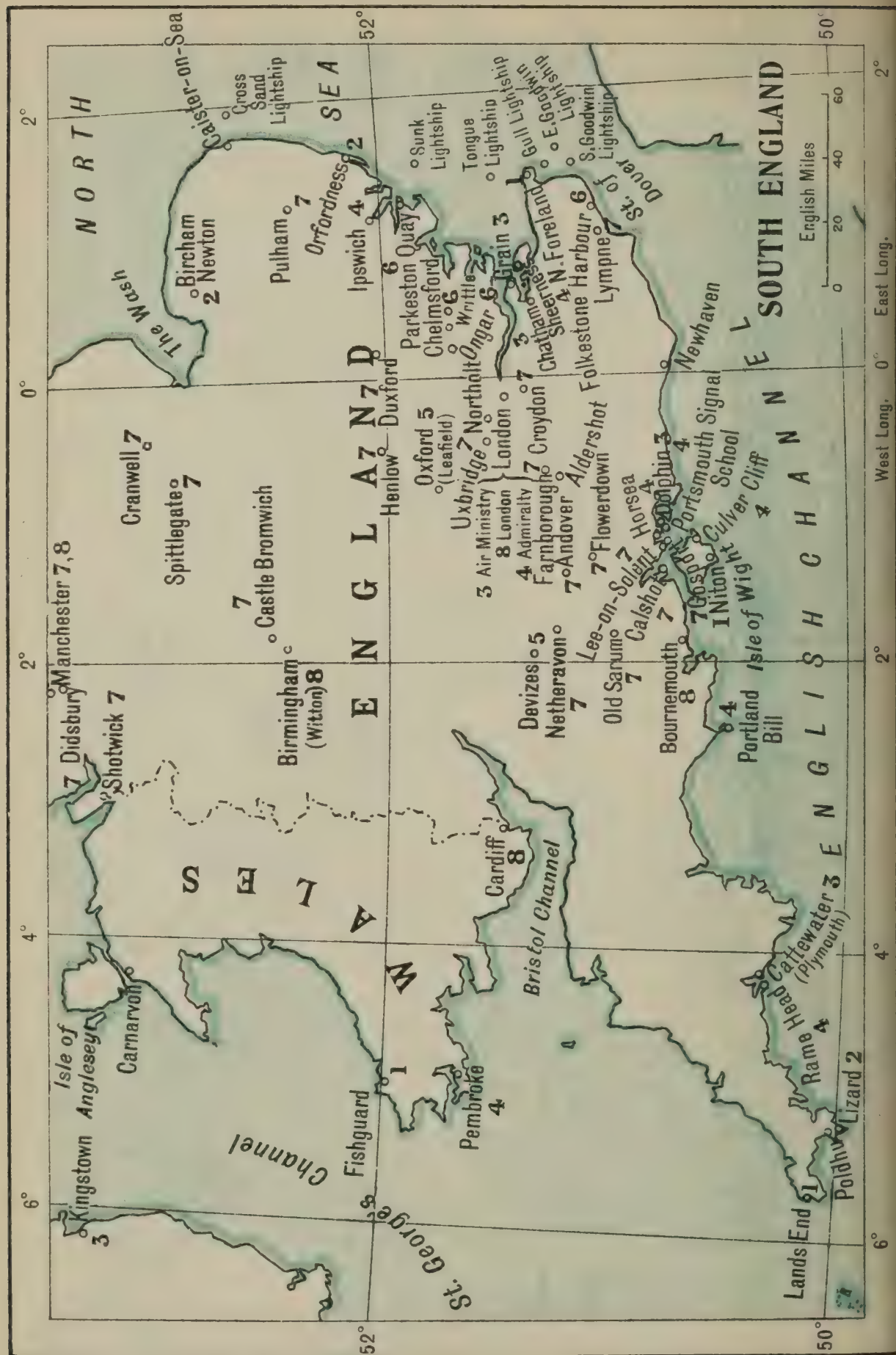
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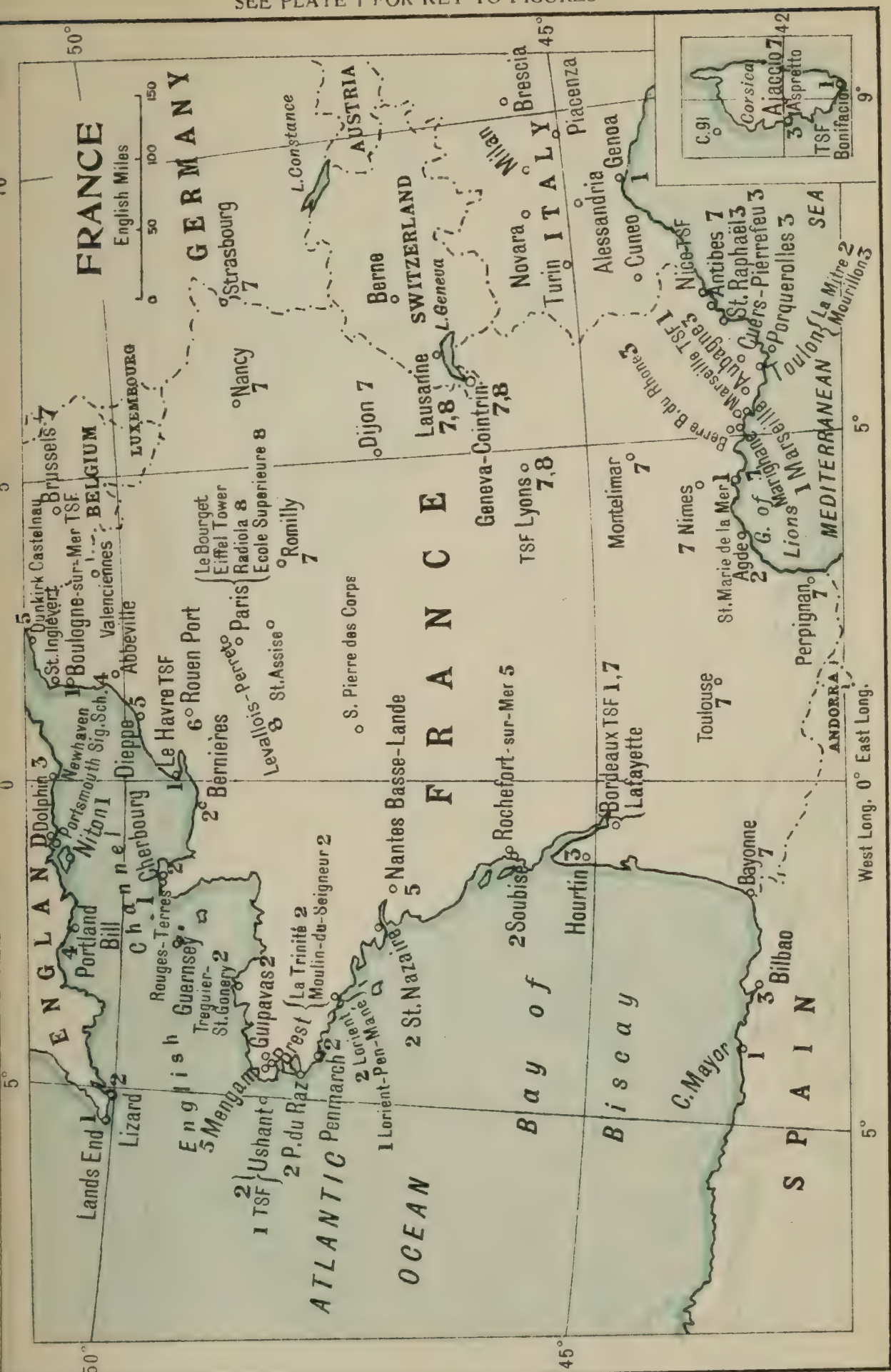
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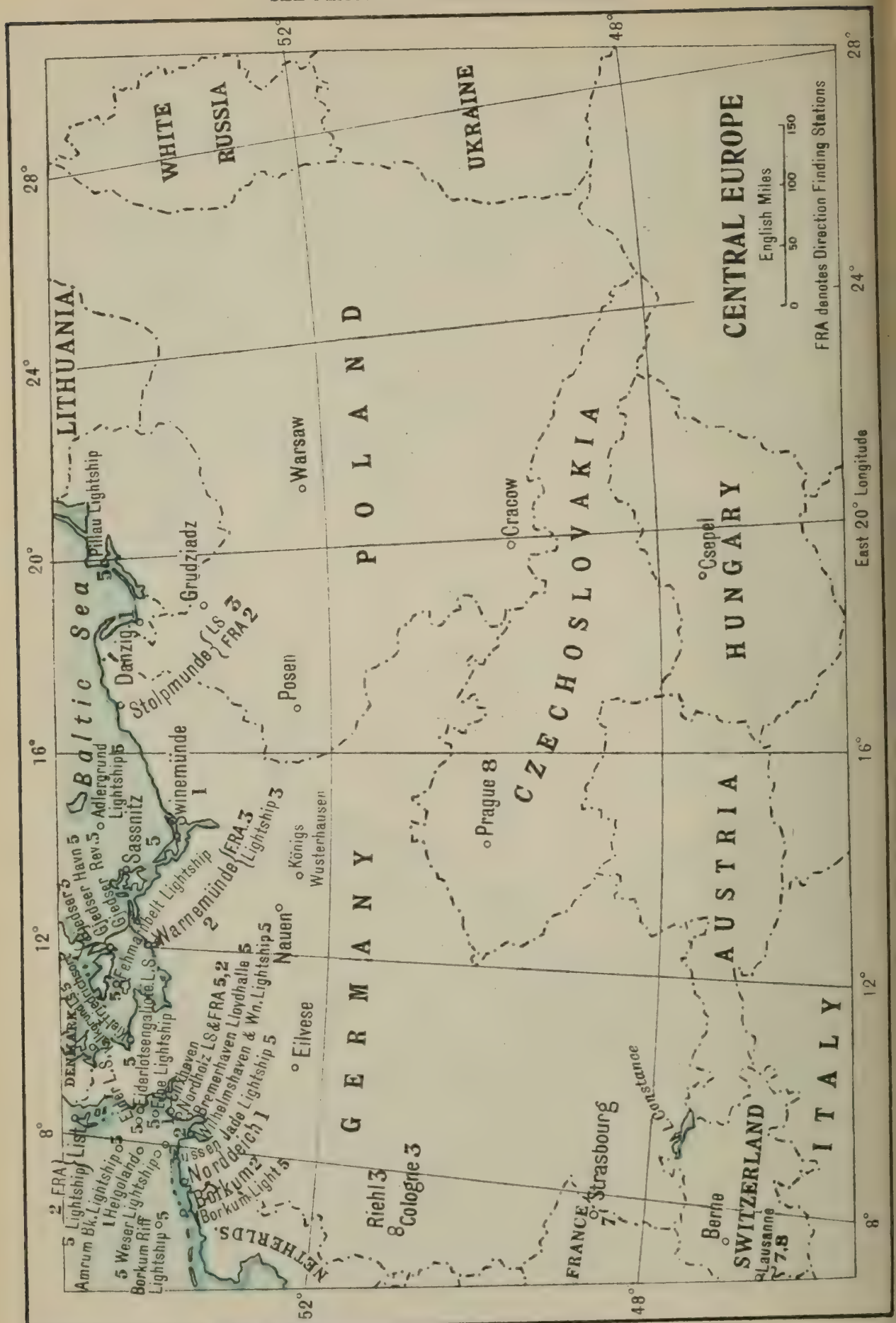


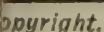
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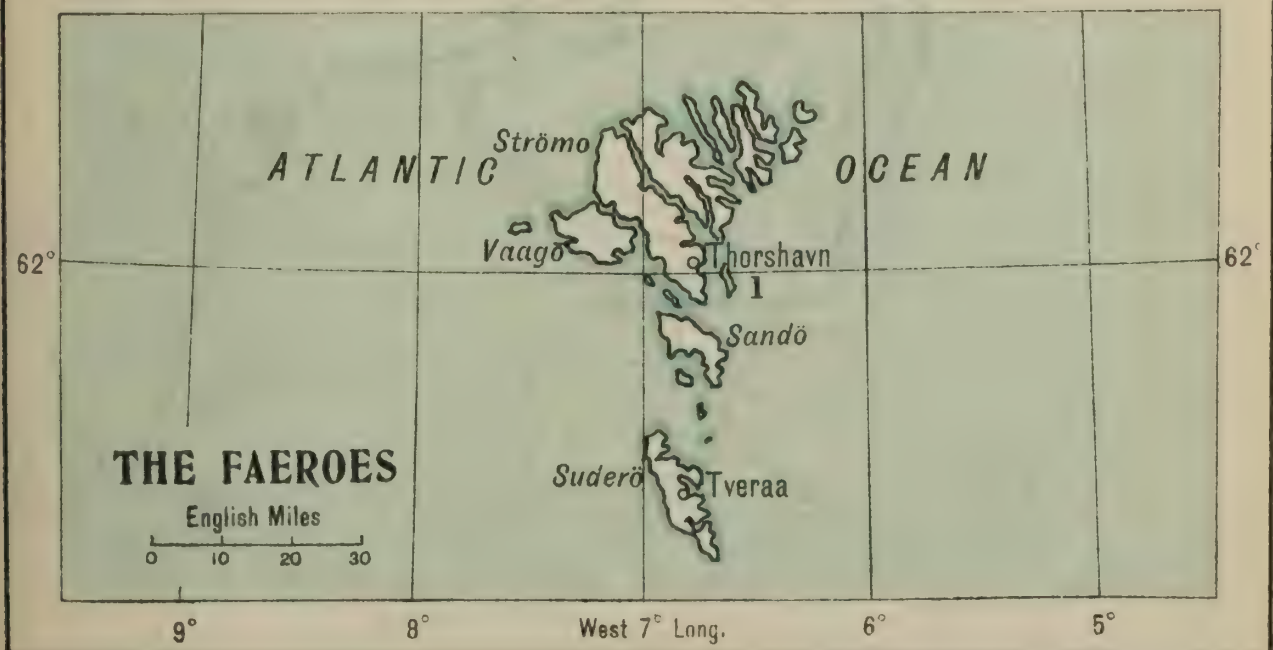
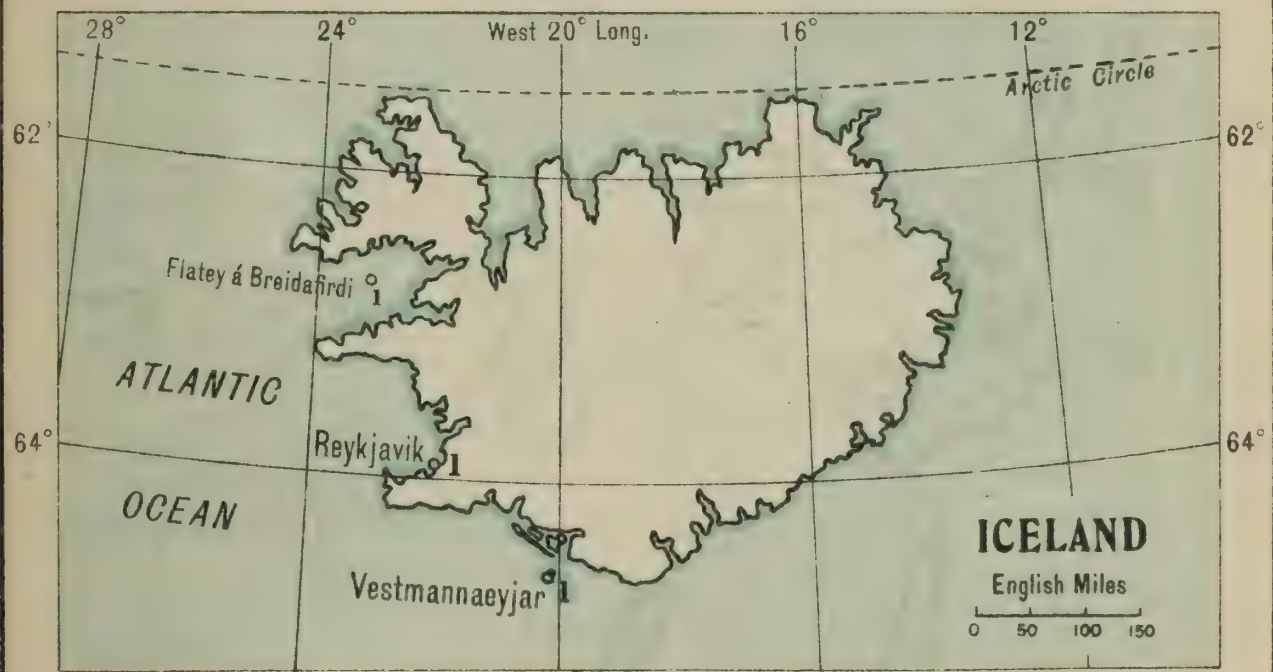
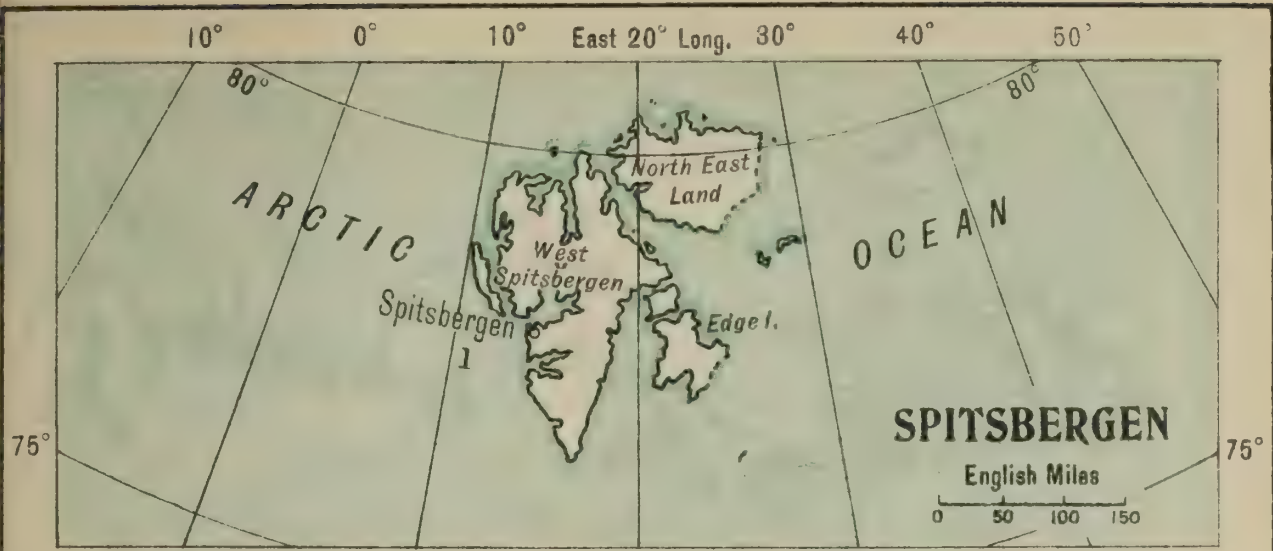


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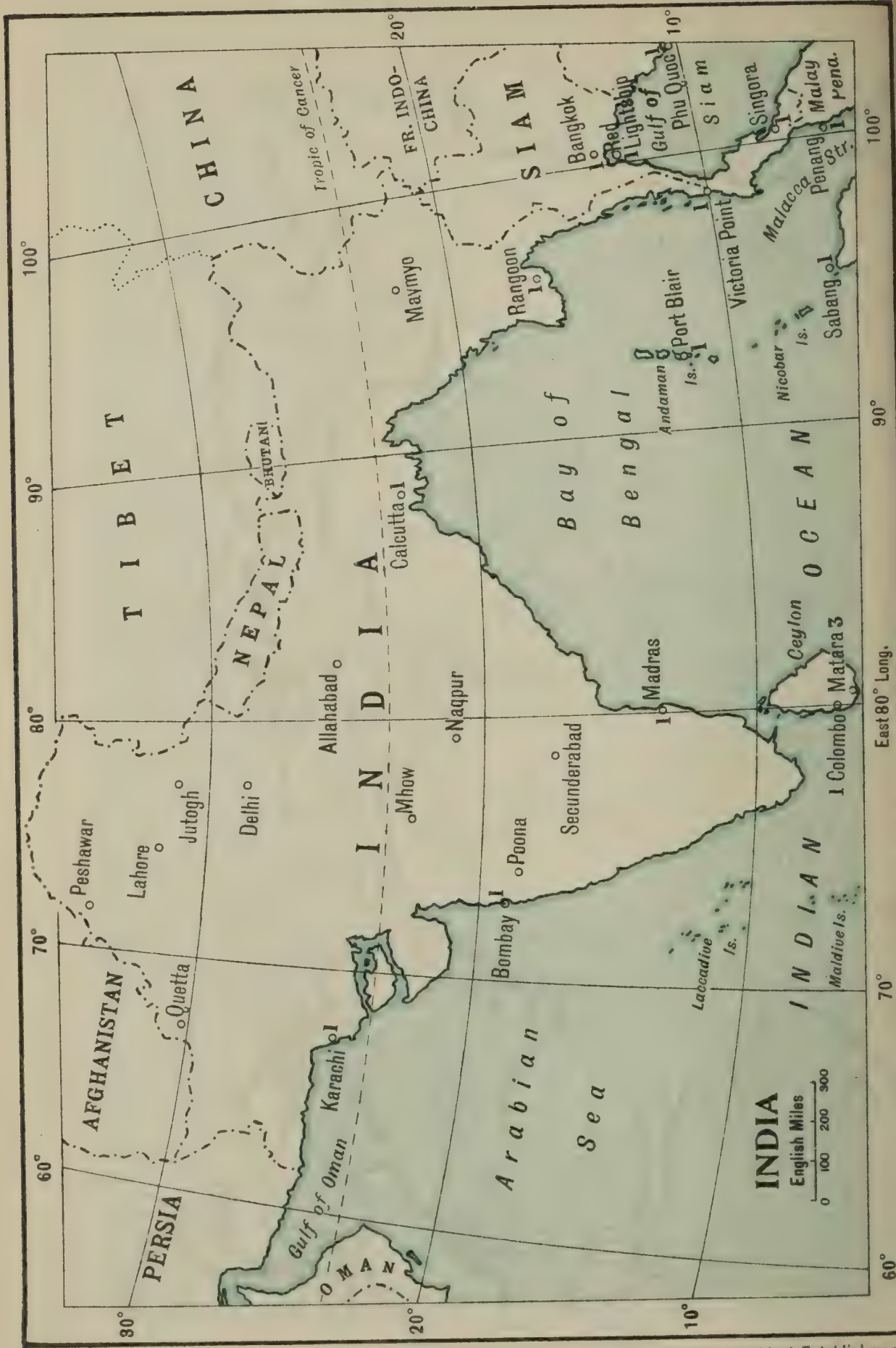
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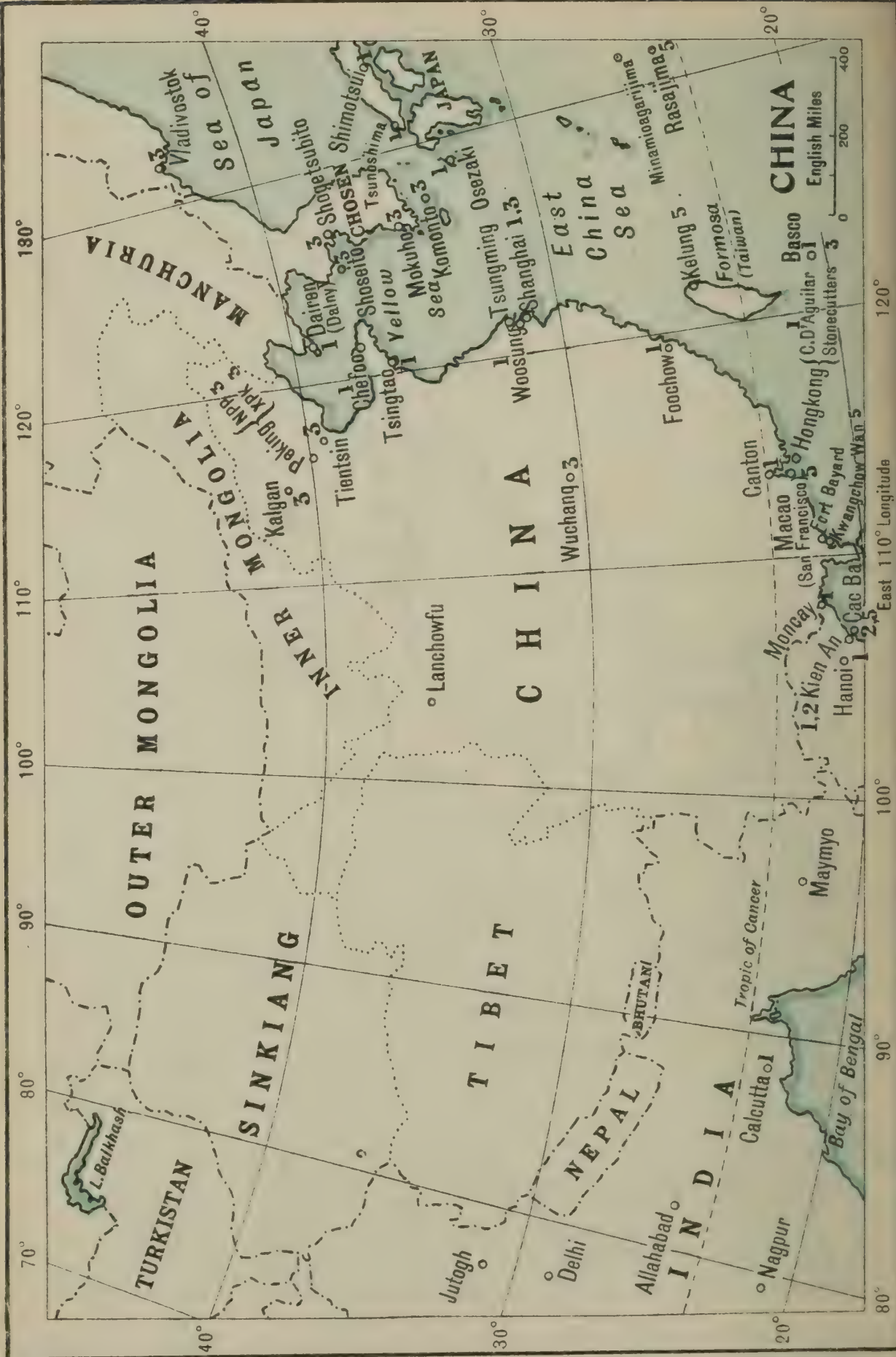


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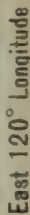






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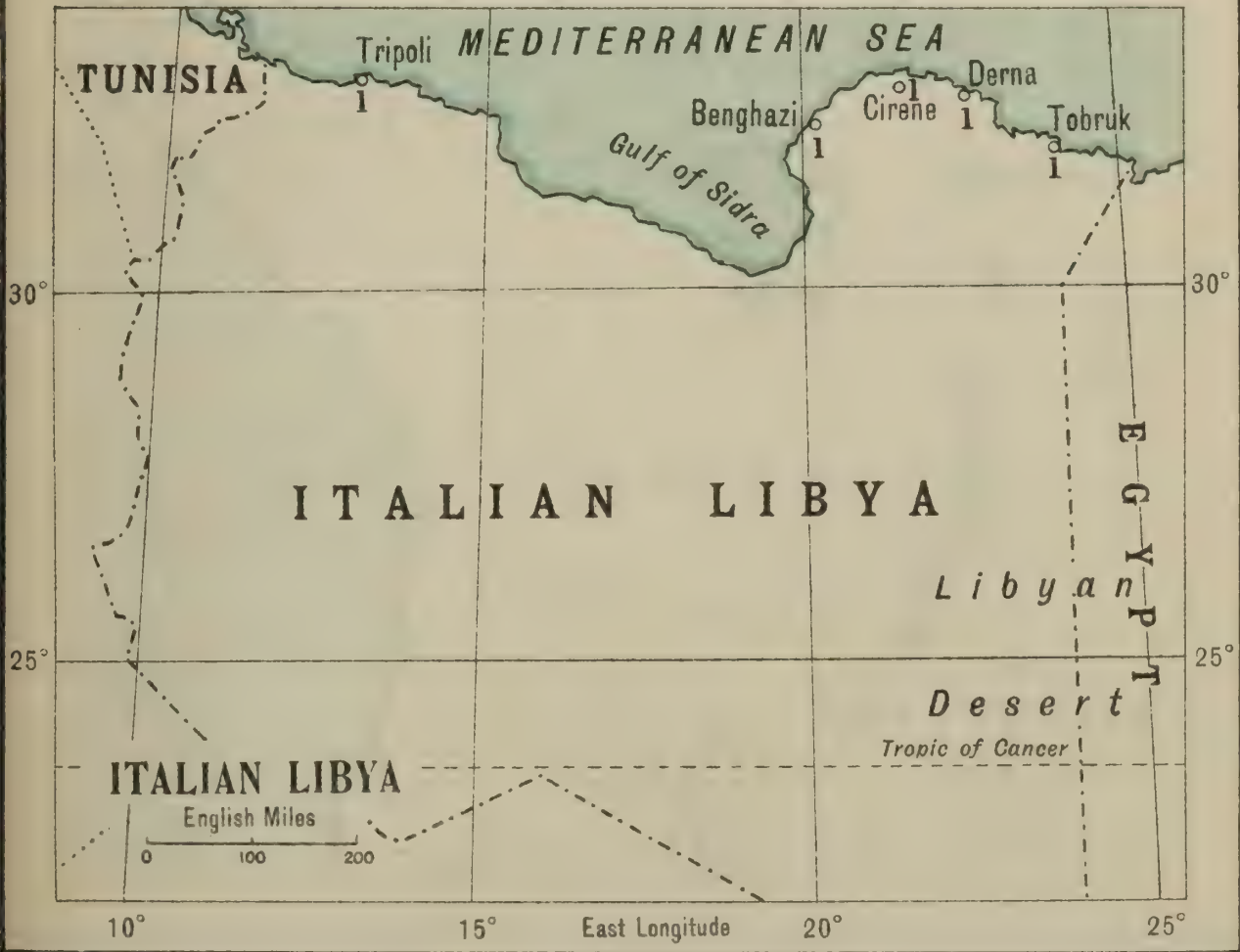
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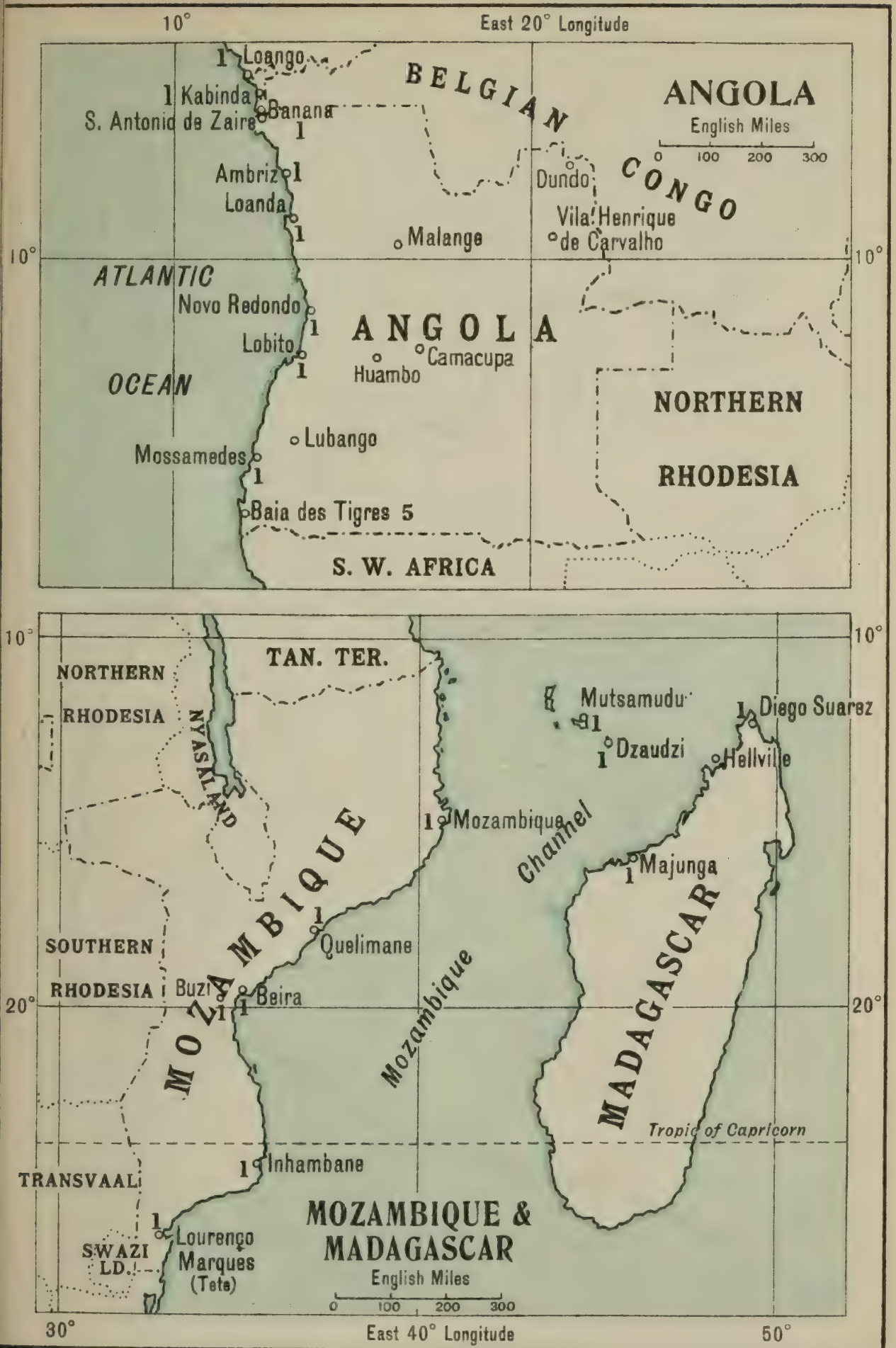
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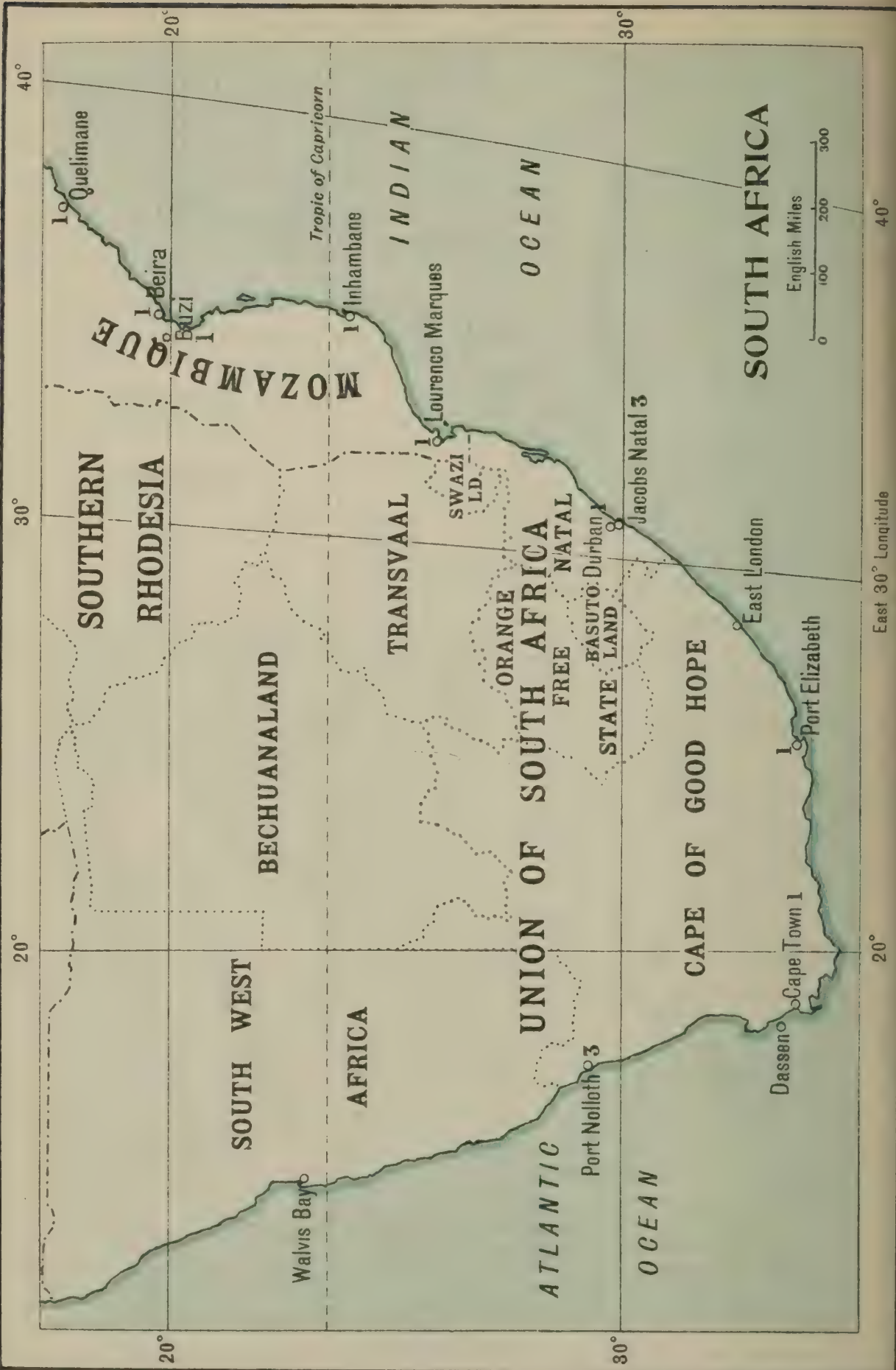
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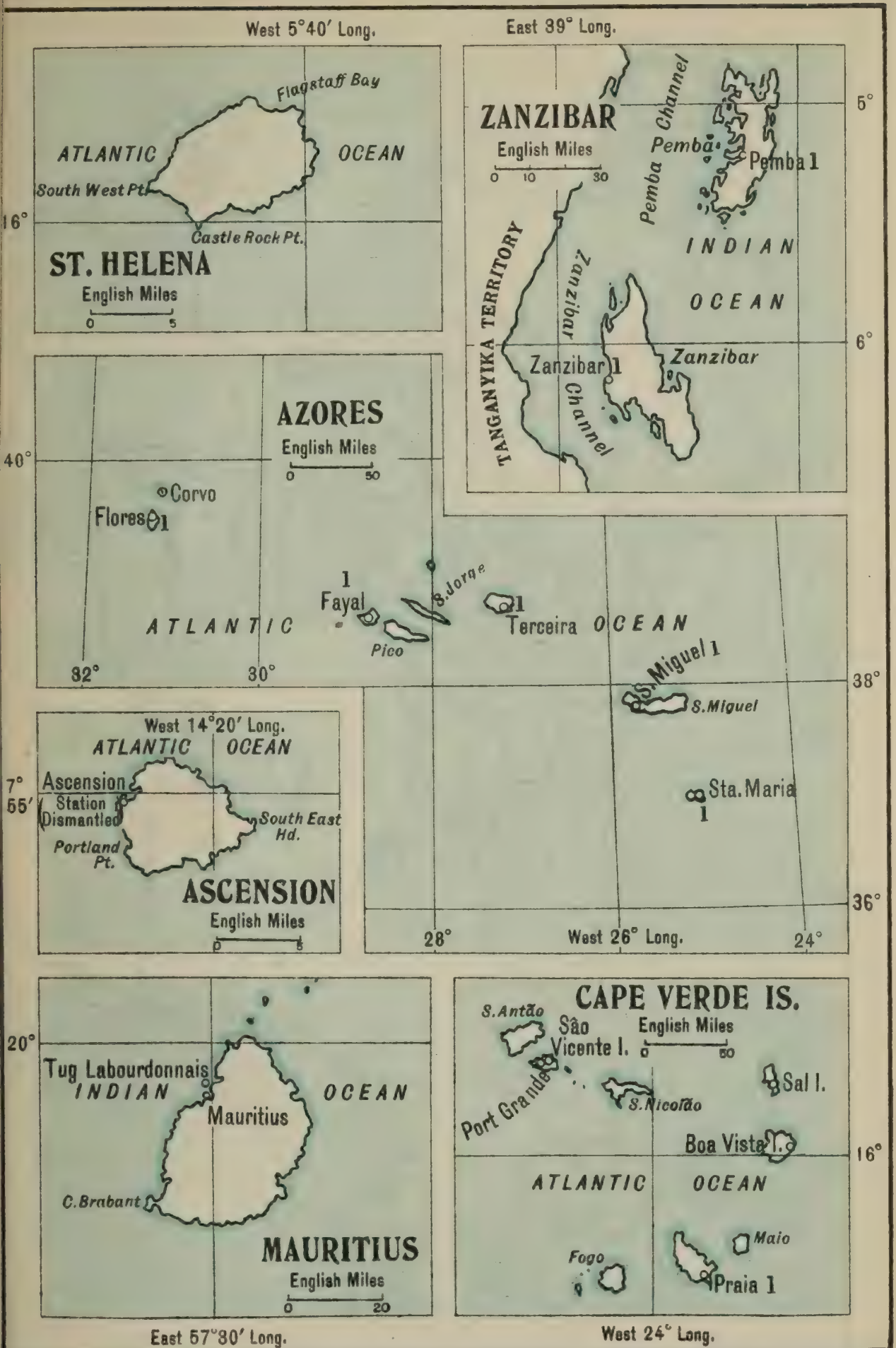
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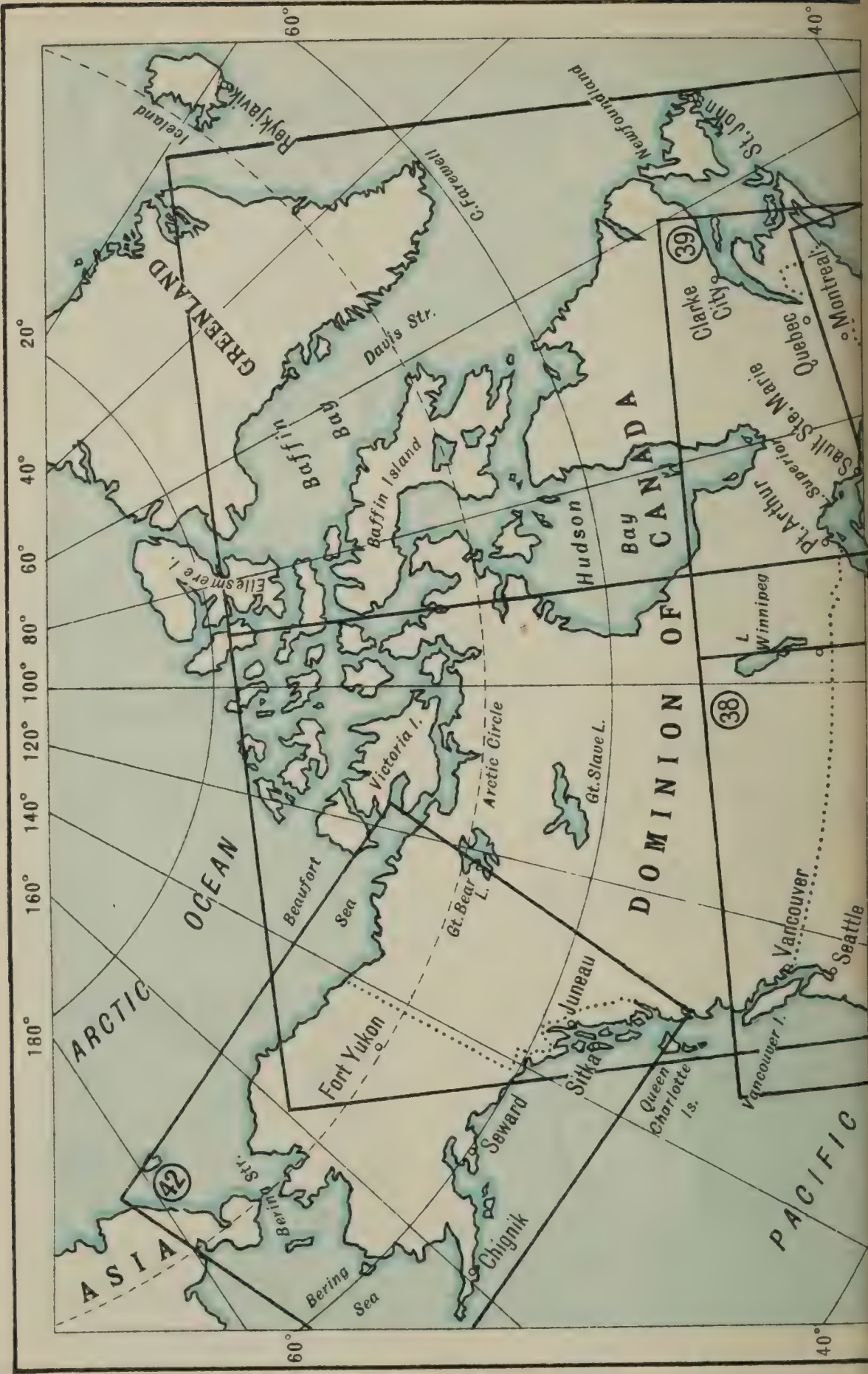


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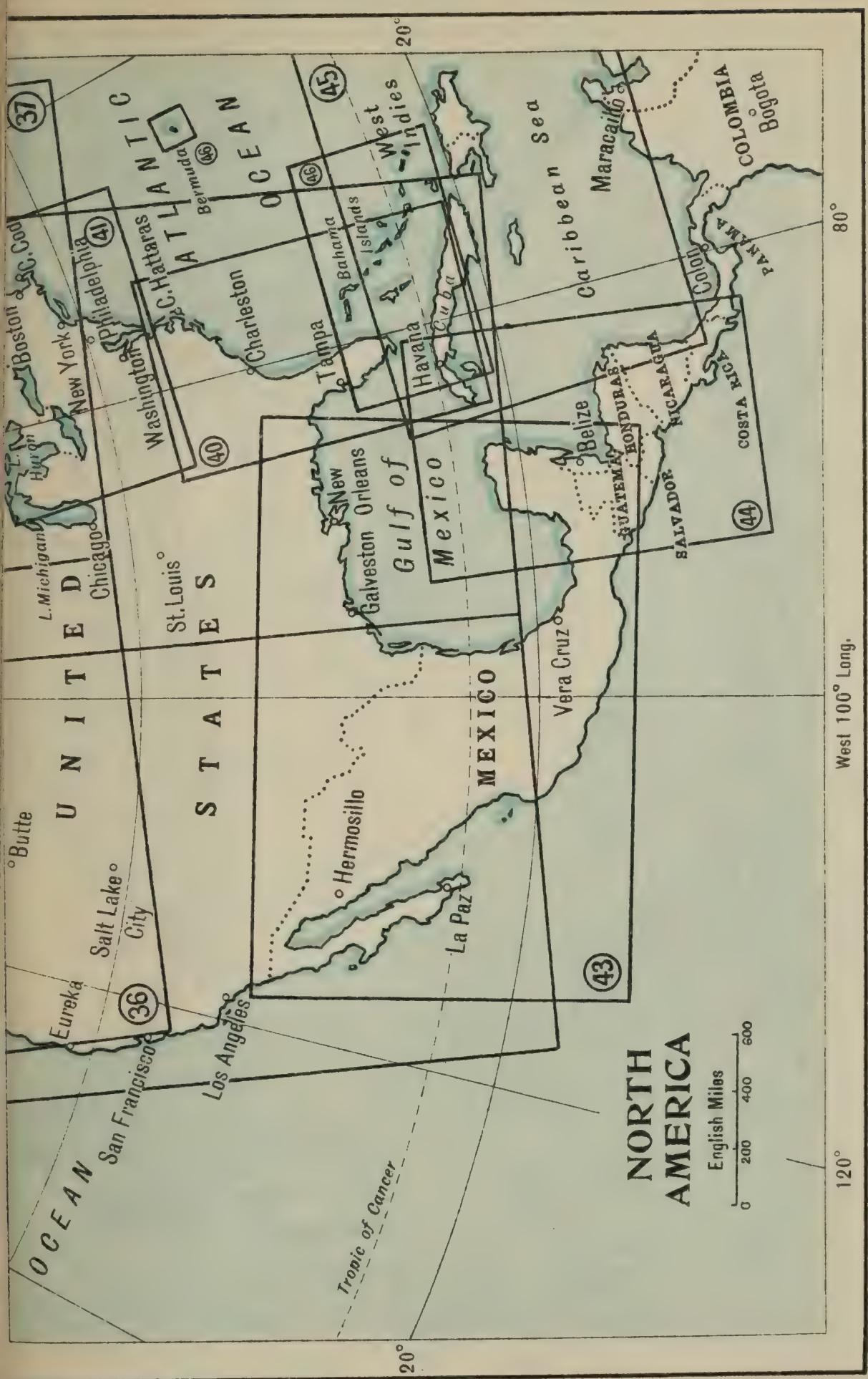


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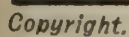


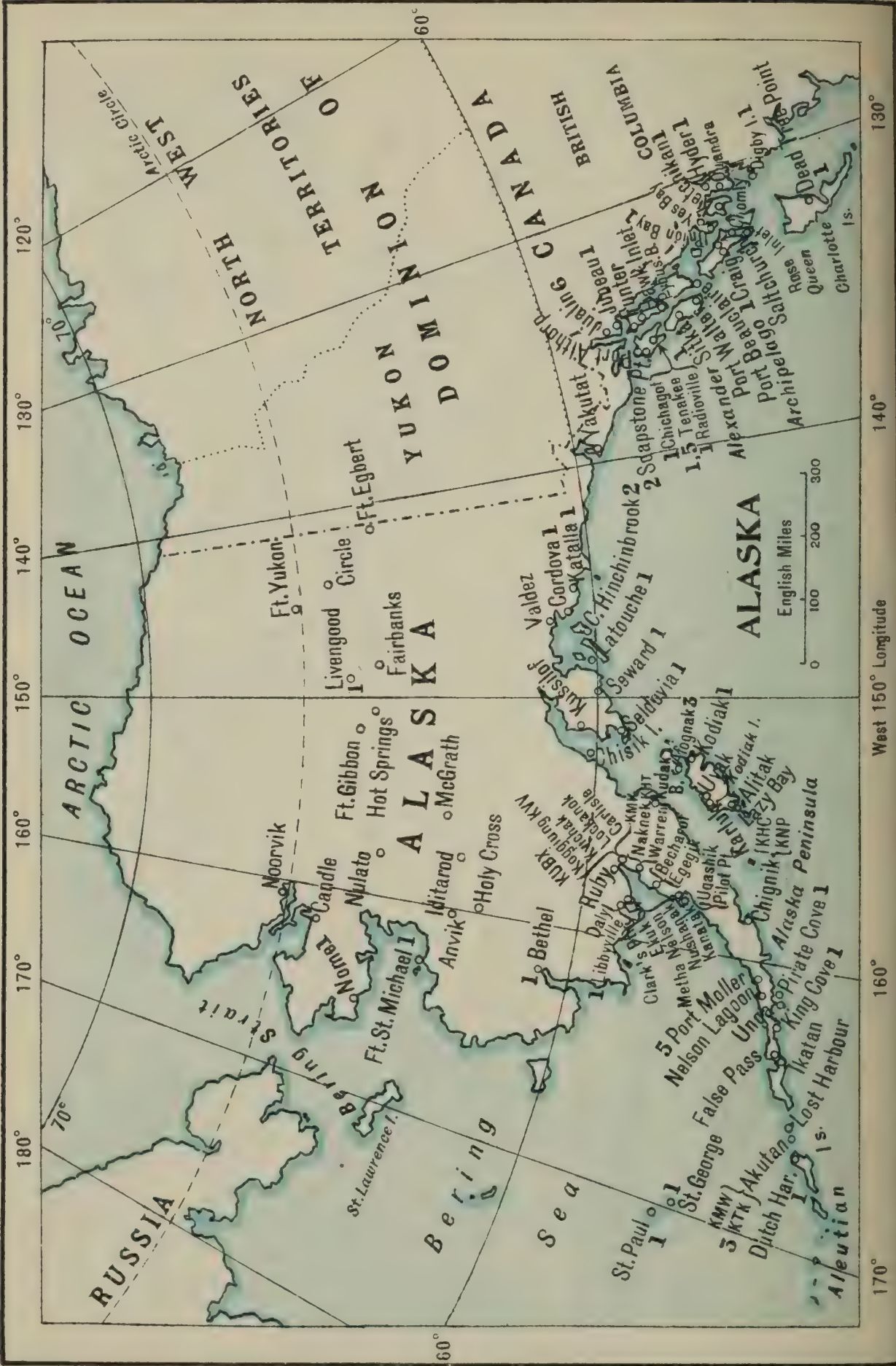
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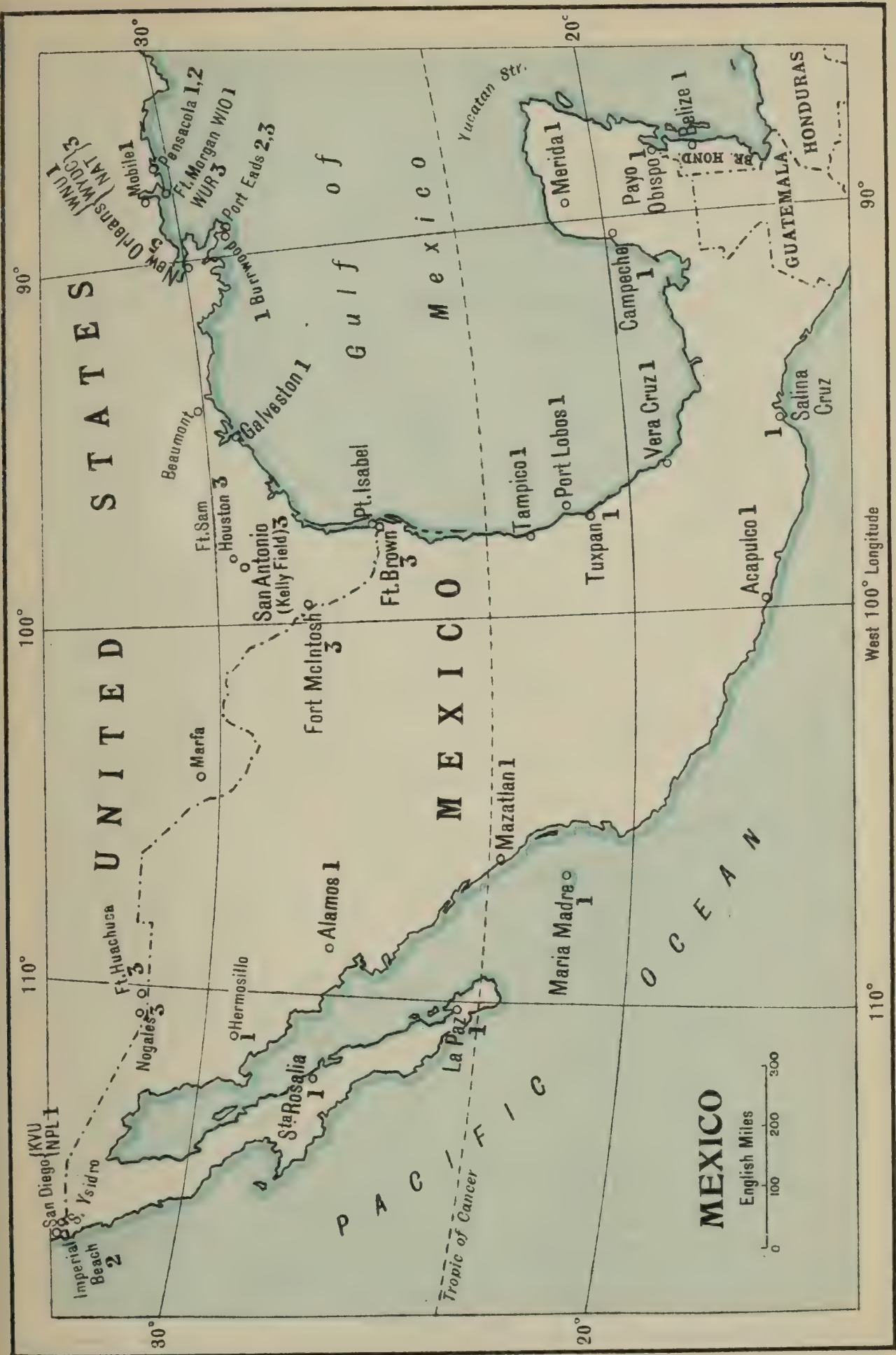




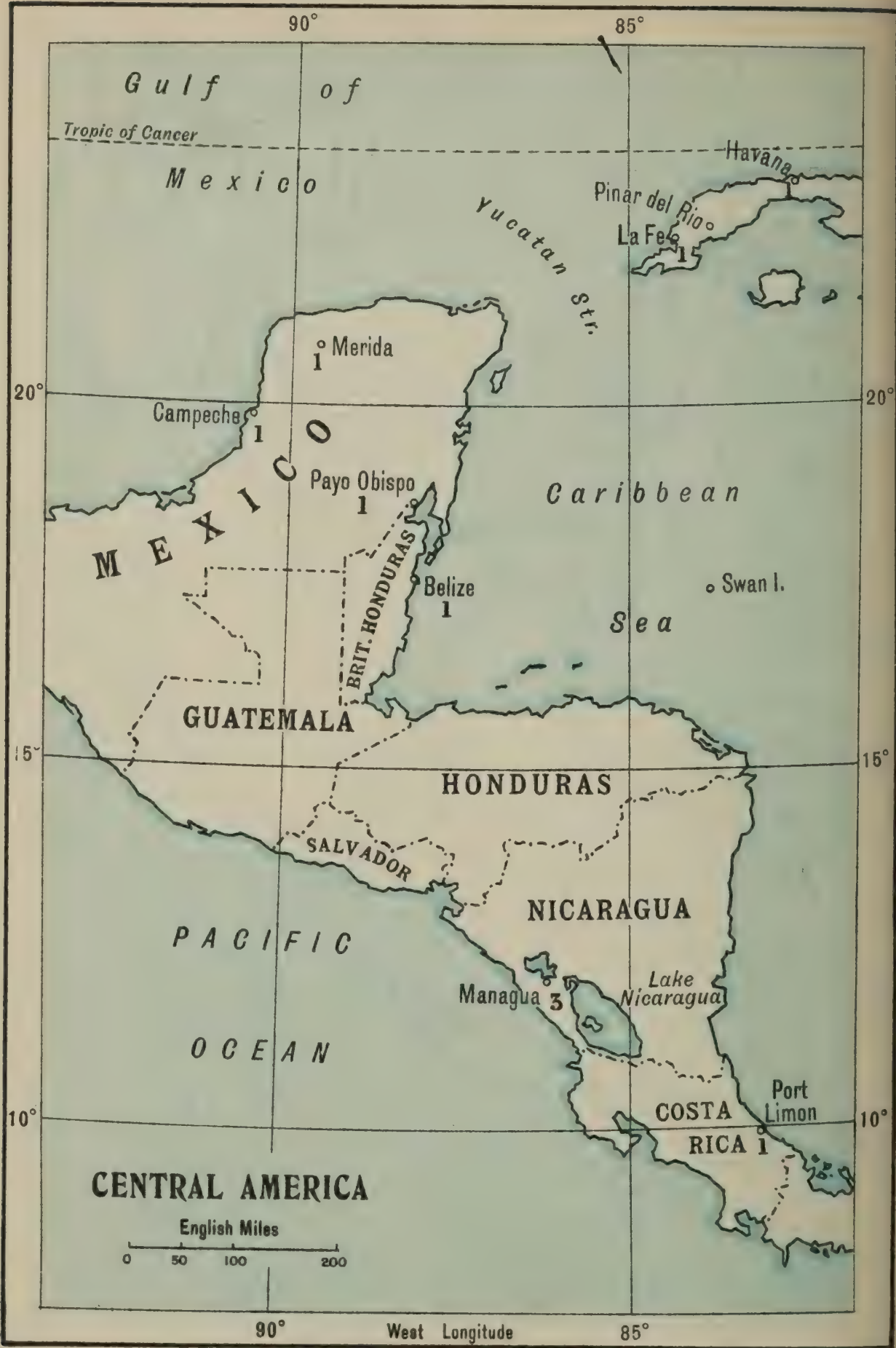




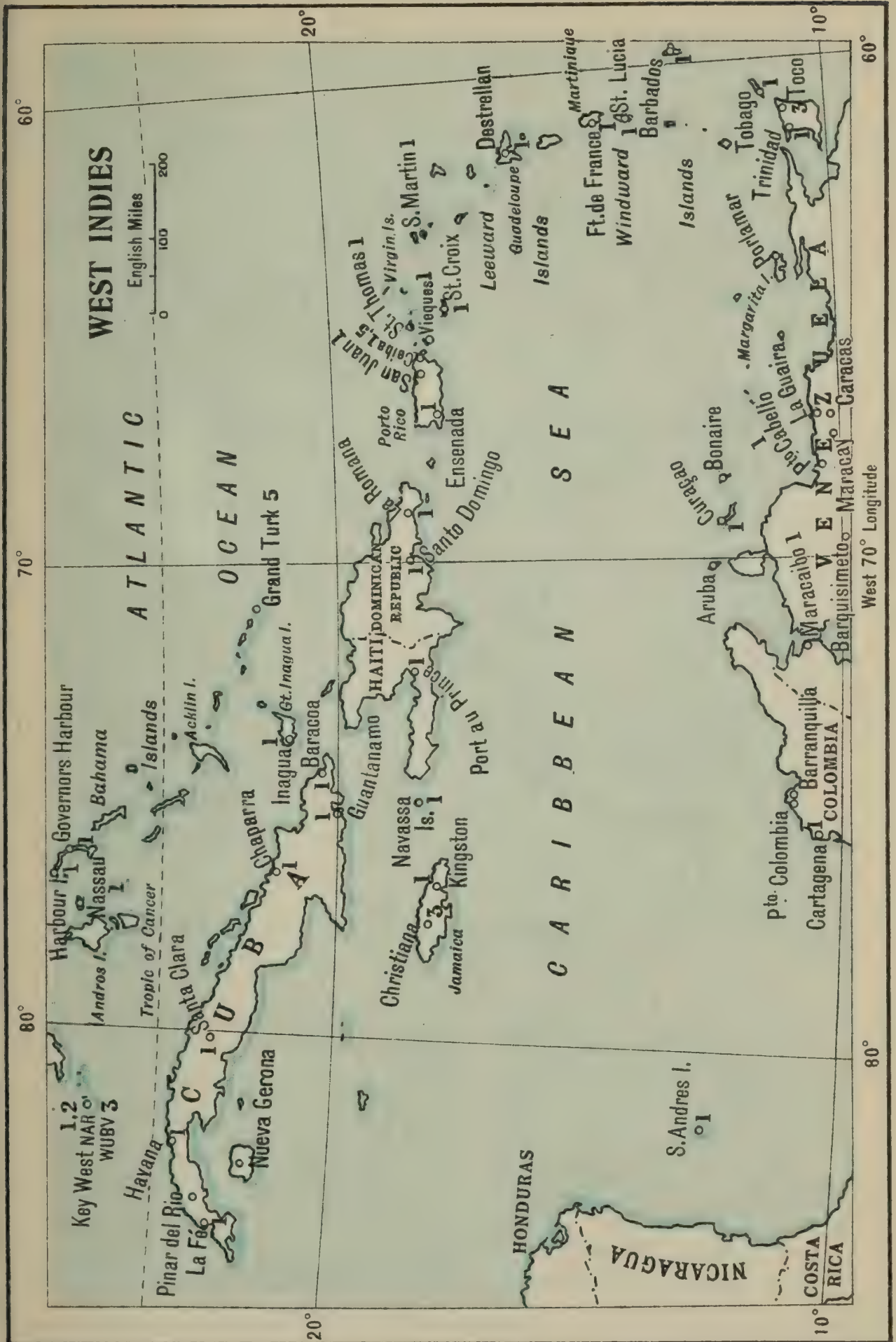
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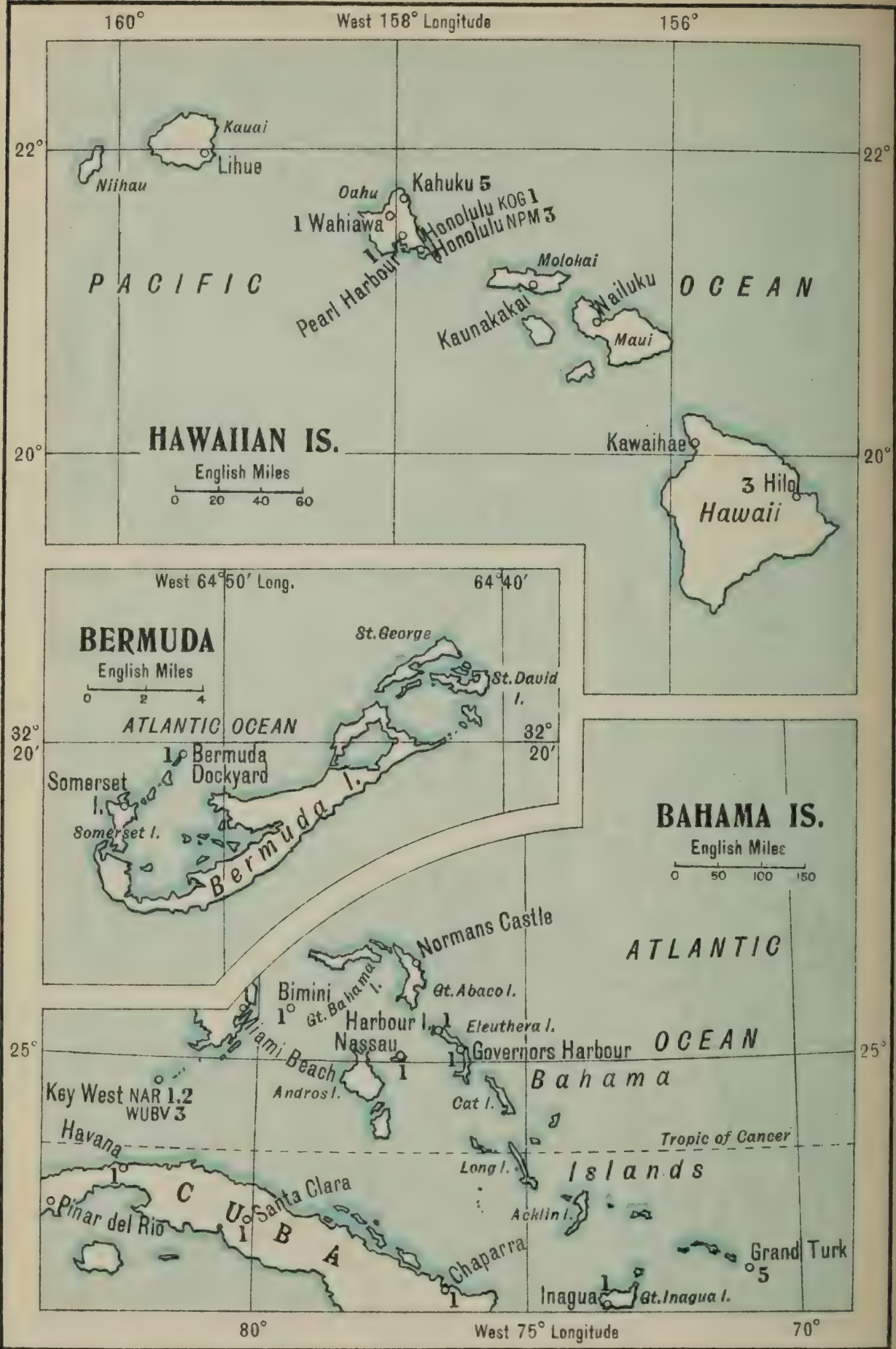
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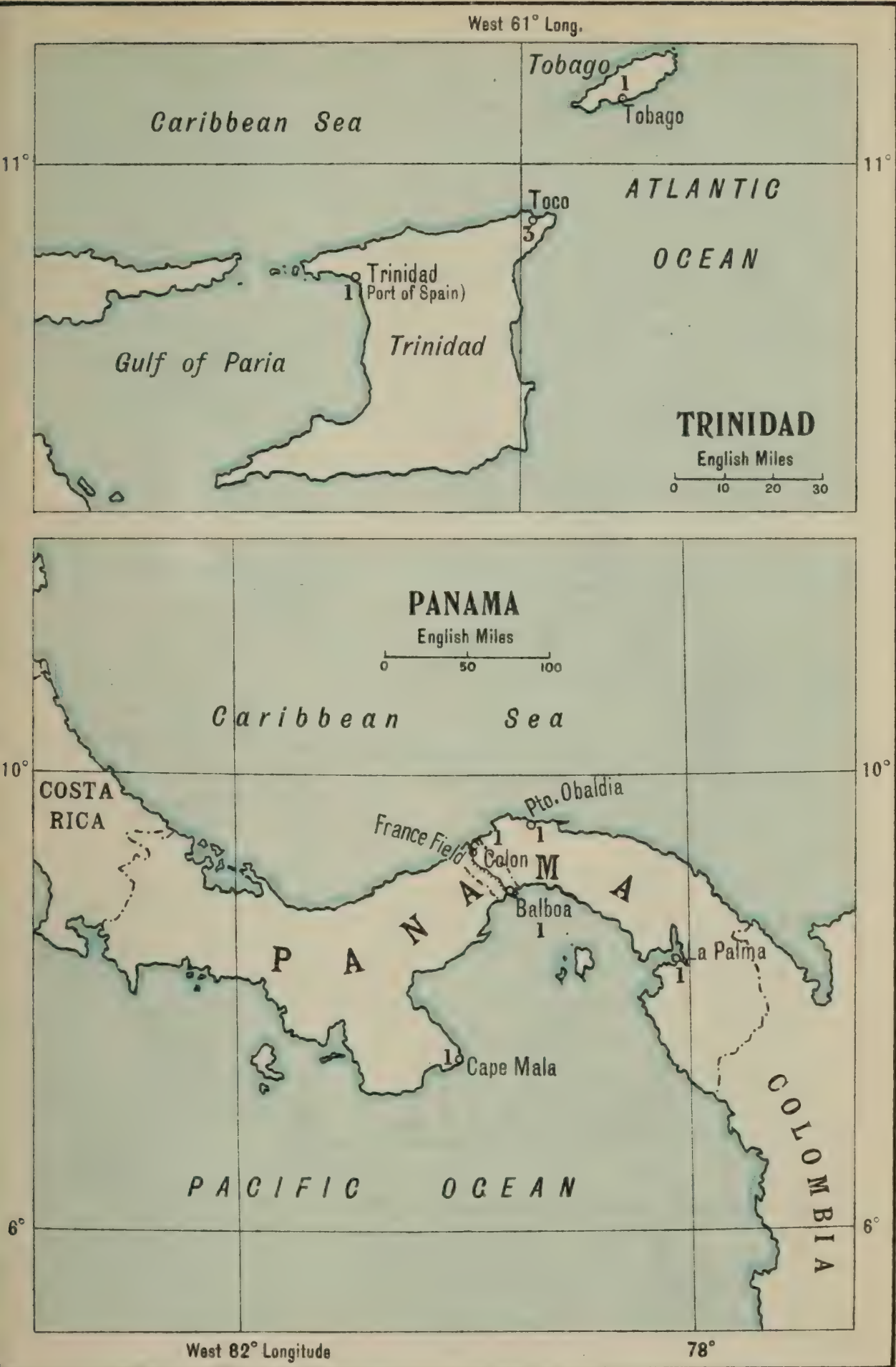
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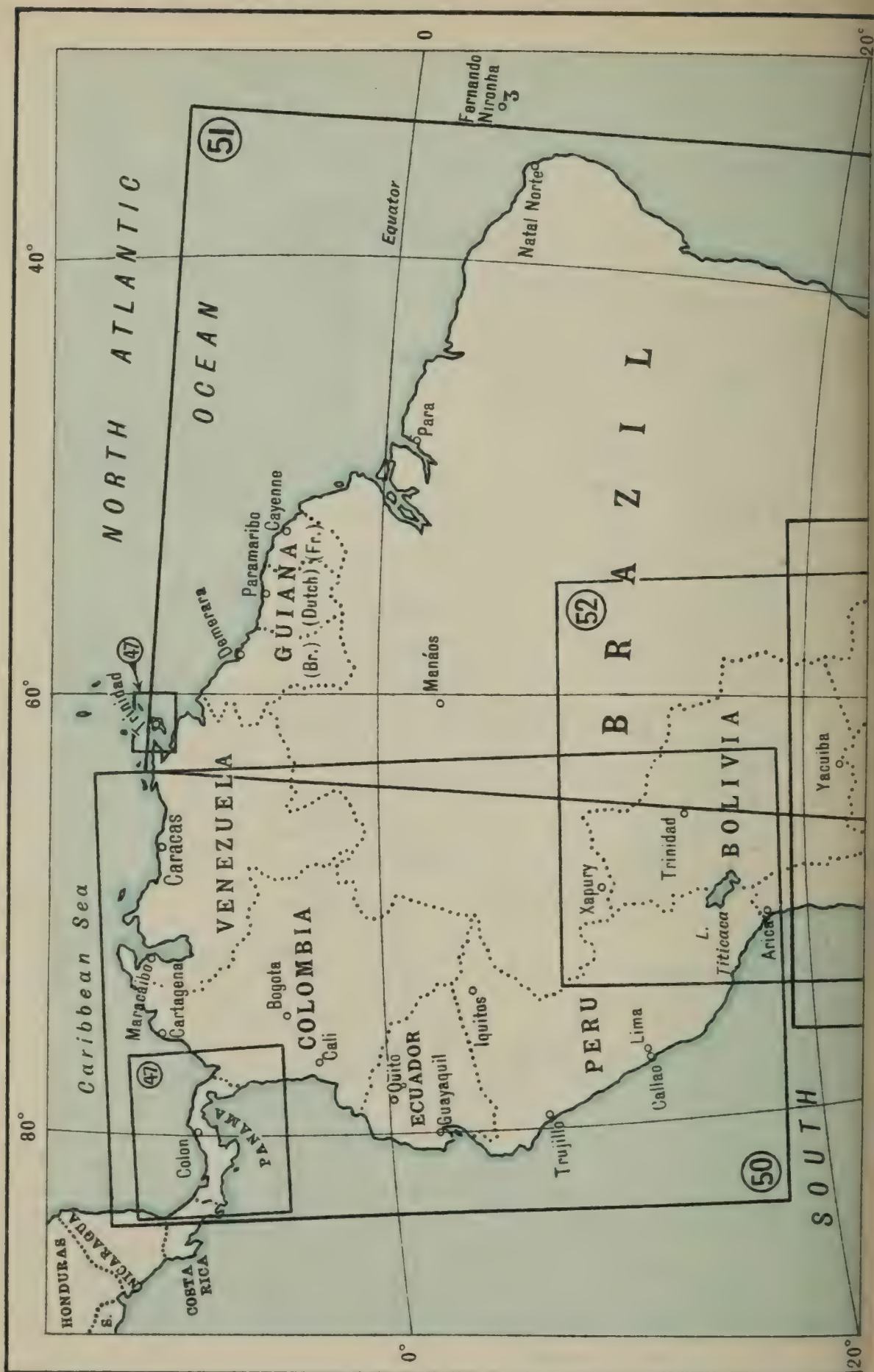


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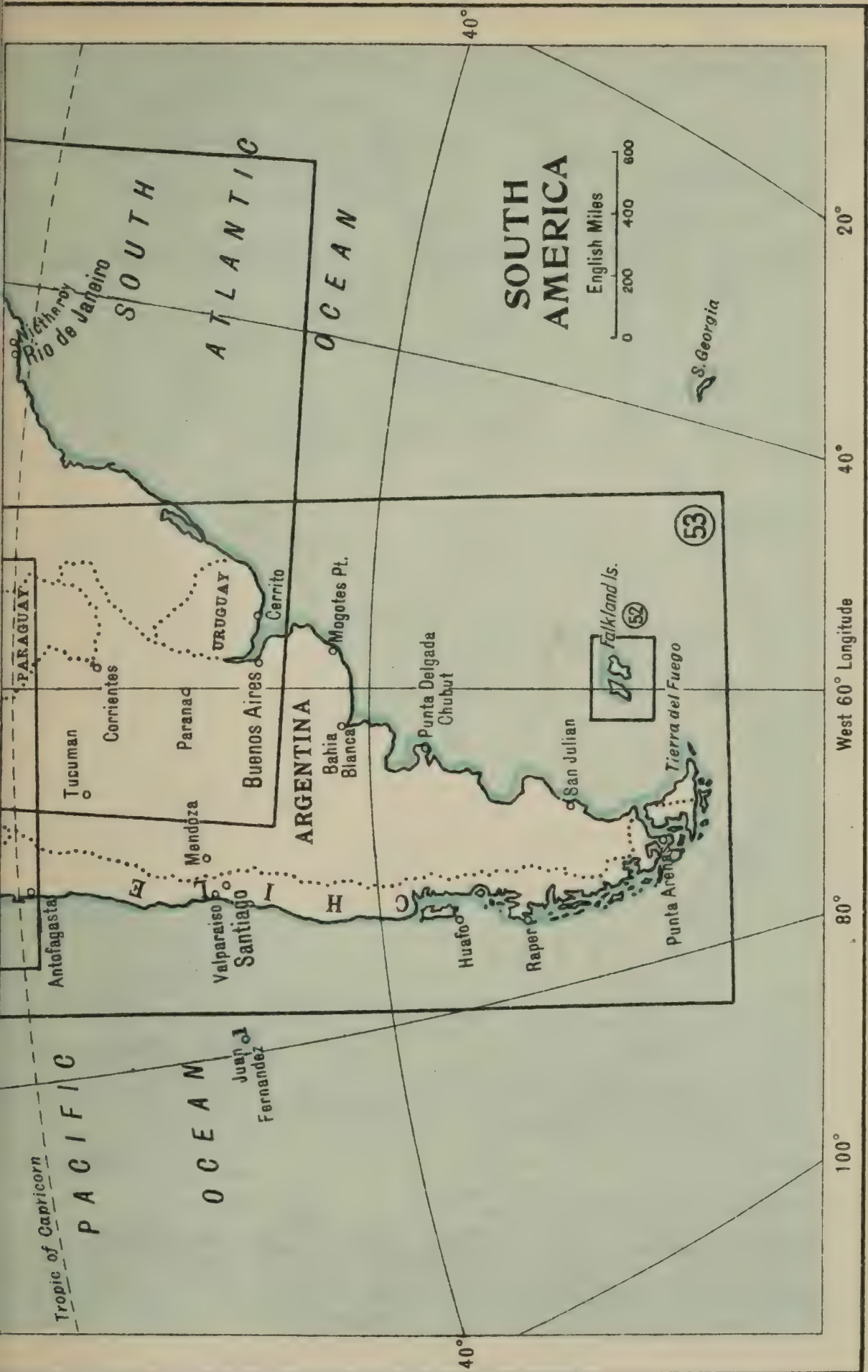


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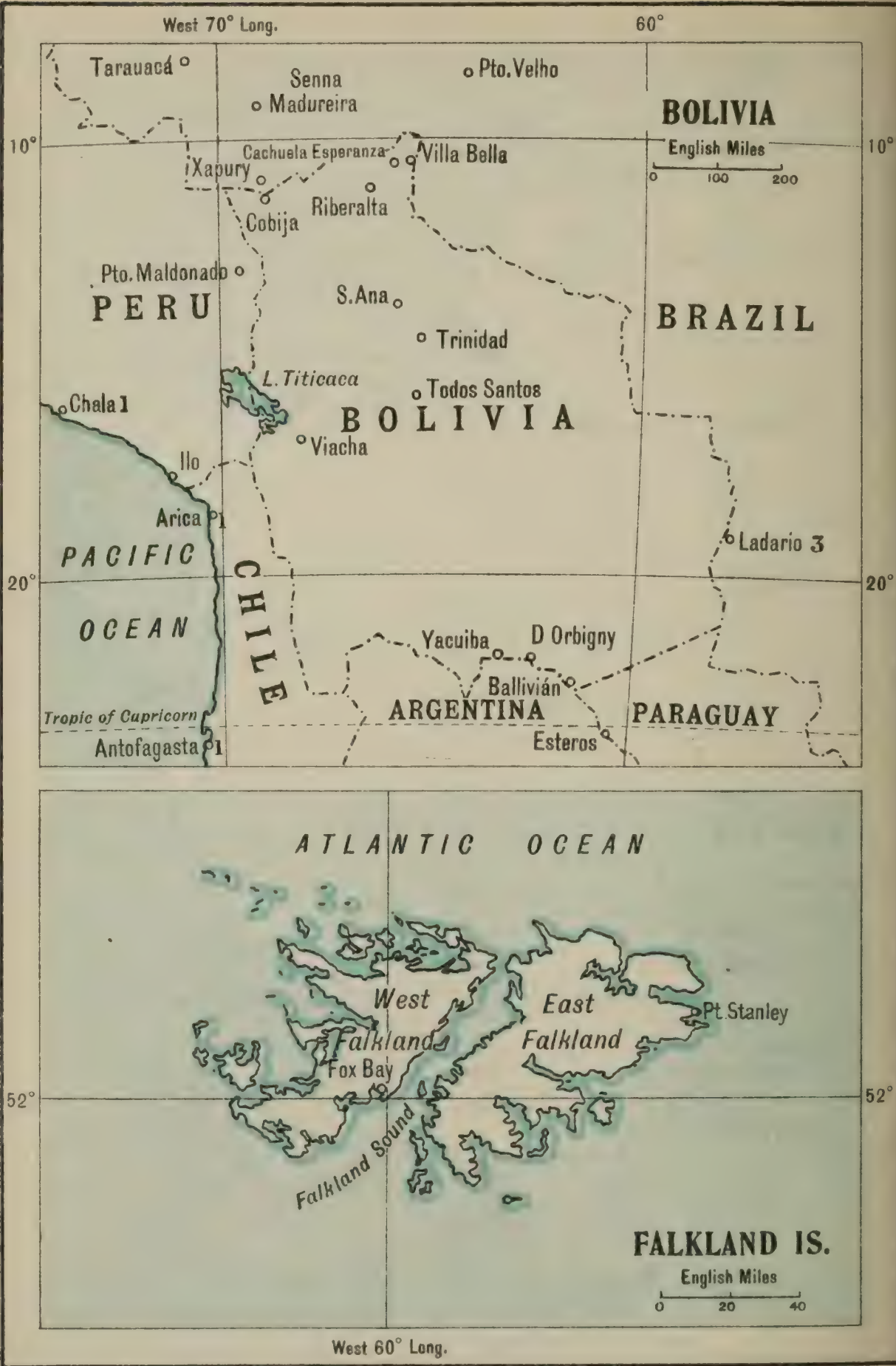
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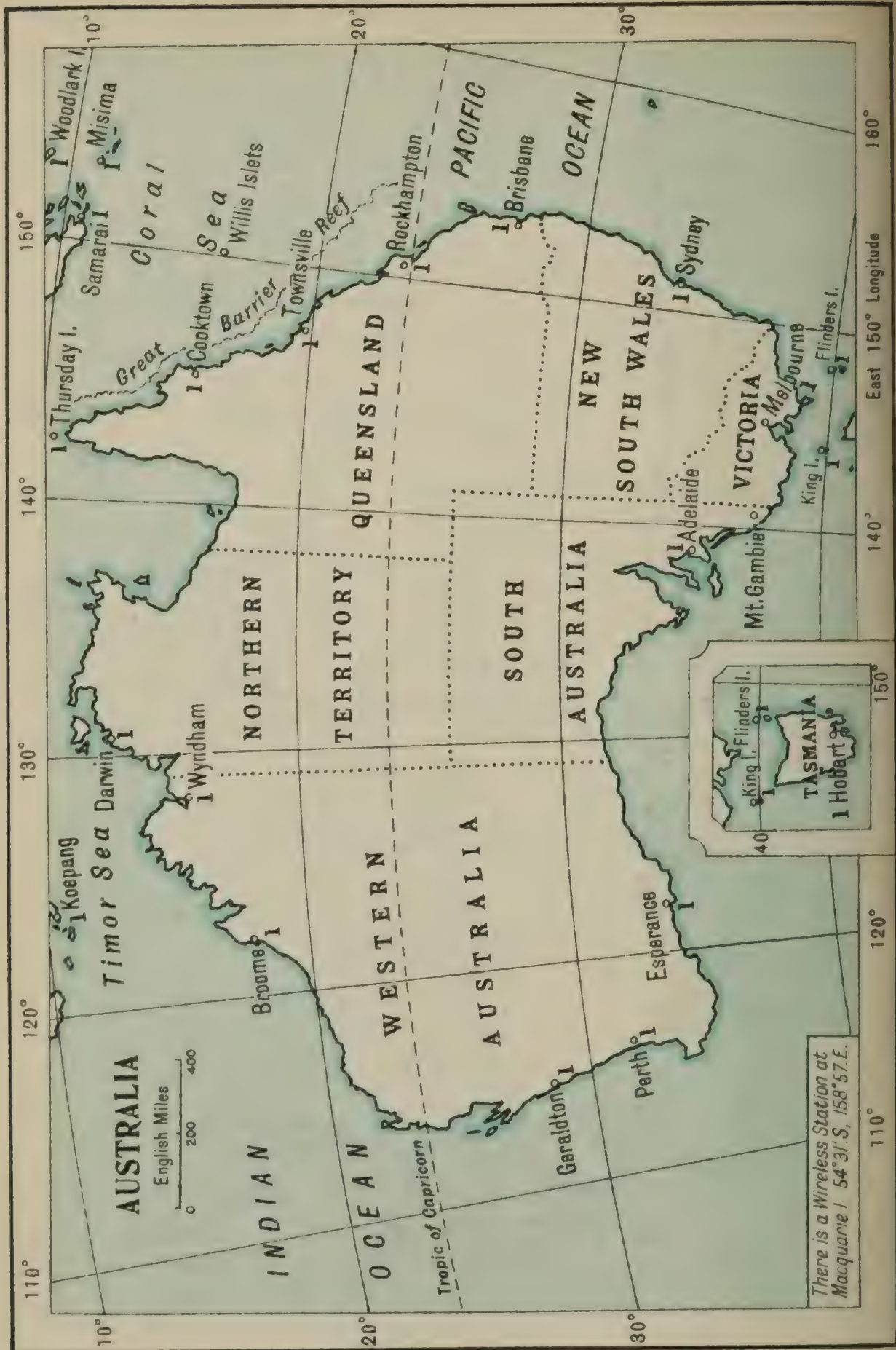
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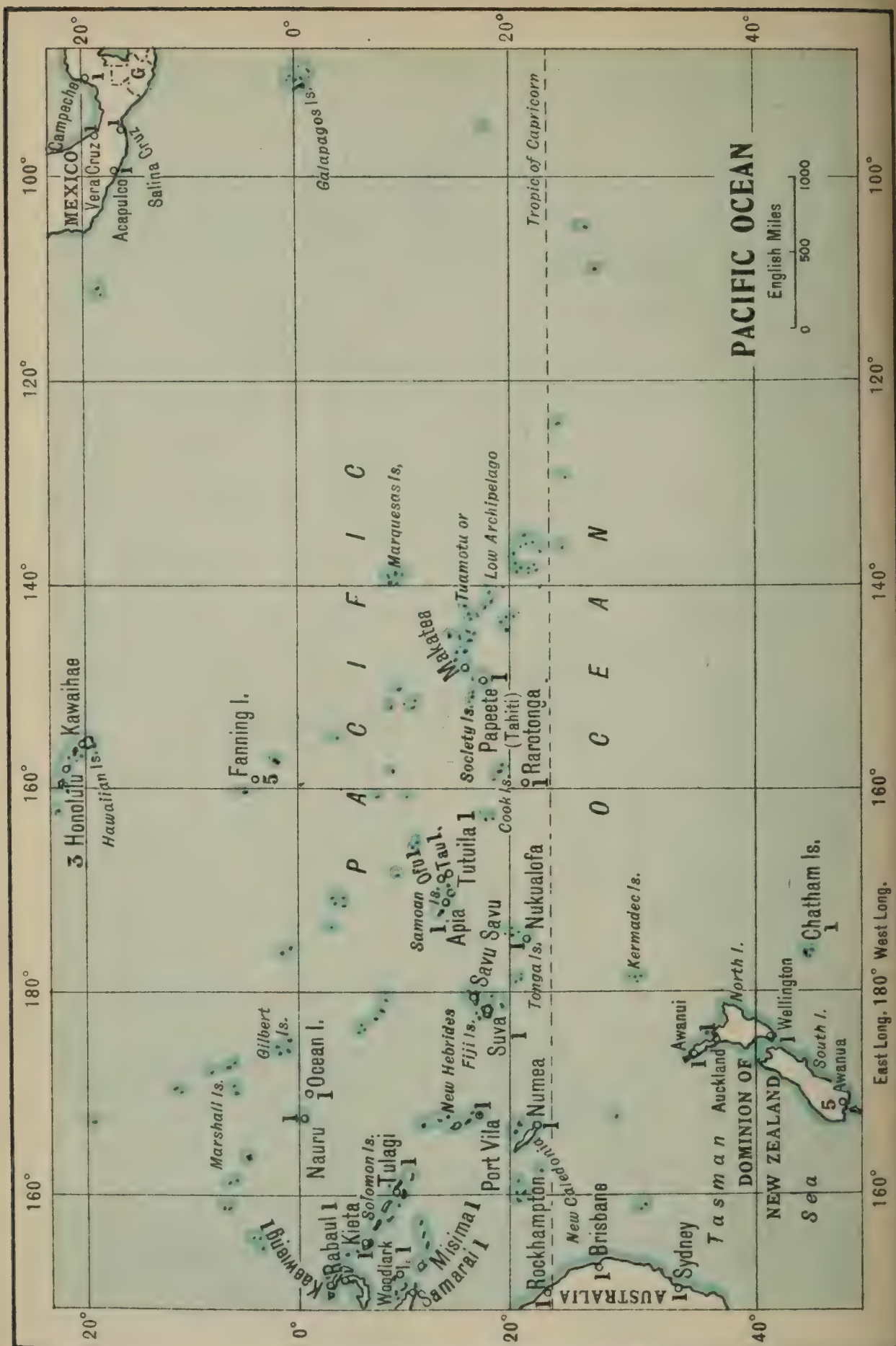


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DEFINITIONS OF TECHNICAL TERMS.

AERIAL.—The conductor or system of conductors designed to radiate or receive energy from the æther in the form of electro-magnetic waves.

AERIAL-DIRECTIONAL.—An aerial system designed to radiate or absorb energy better in some direction than in others.

ÆTHER.—The imponderable elastic, all-pervading medium which is assumed to exist in order to explain the transmission of energy in the form of electro-magnetic waves.

ALTERNATOR.—A generator of alternating current, which is a current periodically changing in direction of flow.

AMPLITUDE.—The maximum value of current or voltage attained during a half period of alternating current or voltage.

AMPLIFIER.—An instrument for increasing the effect of weak received signals by causing them to control a local source of energy varying in accordance with that received. (See also triode.)

AMPLIFICATION, Co-EFFICIENT OF.—The ratio of the useful effect produced by the employment of an amplifier to that obtained without it. In a triode it may be defined as the ratio of the slopes of the grid voltage and anode voltage against anode current curves at the operating point.

ANODE.—The positive electrode.

ANTENNA.—(See Aerial.)

ANTINODE.—In a linear oscillating circuit is the point of maximum amplitude of the quantity under consideration. The Antinode of current is the node of potential.

APERIODIC CIRCUIT.—Is one which has no definite time period and in which a current, if started, dies down without reversing.

ARC.—A luminous discharge of electricity through a gas in which the material of one or both of the electrodes is volatilised and takes part in the conduction of the current, whether continuous or alternating.

ARRESTER EARTH.—A spark gap with very short gap and large sparking surfaces. It is used to protect the receiving apparatus, which is joined across it, from powerful discharges.

ASYNCHRONOUS.—Two periodic forces are said to be asynchronous when their time periods are different from each other.

ATMOSPHERIC ABSORPTION.—That portion of the total loss of radiated energy due to atmospheric conductivity.

ATMOSPHERICS.—Electromagnetic waves produced by disturbances in the atmosphere or in the earth's surface.

ATTENUATION.—Is the loss of strength of waves due to atmospheric absorption.

ATTENUATION, Co-EFFICIENT OF.—The co-efficient which, when multiplied by the distance of transmission, gives the natural logarithm of the ratio of the amplitude of the electric or magnetic force at that distance to the initial value of the corresponding quantity.

AUDIO-FREQUENCY.—The range of frequencies perceptible by the ear, *i.e.*, between 40 and 20,000 per second.

AUDION.—De Forest's three-electrode valve.

AUTODYNE.—Another name for self-heterodyne.

AUTO-TRANSFORMER.—A transformer in which the primary and secondary windings are tapped off the same coil and have a number of turns in common.

BALANCING AERIAL.—An aerial used in duplex wireless telegraphy to eliminate the effect of the local transmitter.

BARRETTTER.—A receiving instrument in which the electric-conductivity is altered by the heat generated by the reception of waves.

BEAT.—When two oscillations of slightly different frequencies are impressed on an electrical circuit, they periodically help and oppose each other. The result is an oscillation, the amplitude of which varies in a regular and periodic manner. The time between two successive maxima of amplitude is called the period of the beat. The beat frequency is equal to the difference of the frequencies of the component oscillations.

BREAK.—An apparatus for producing sudden interruption of an electric circuit.

BUZZER.—A make and break producing weak oscillations which are very convenient for testing purposes.

CALIBRATION.—Of the scale of an instrument is the determination of value of a certain number of fixed points.

CAPACITY.—That property of a material by virtue of which it is capable of storing energy electrostatically. The capacity of a system is dependent on its geometrical dimensions, its position relative to other conductors and the dielectric constants of the surrounding media.

CATHODE.—The negative electrode.

C.G.S.—A system of units based on the centimetre, gramme and second.

CHARACTERISTIC CURVE.—Is a curve drawn to show the relations between two quantities in which the variation of one causes a corresponding variation of the other.

CHOKER.—A coil with large inductance and small resistance designed to prevent the passage of alternating current, but to permit the passage of continuous current.

CIRCUITS, CLOSED AND OPEN.—A closed oscillating circuit is one in which the capacity and inductance are substantially localised in different places, while an open radiating or absorbing circuit, though it may have additional localised capacity and inductance, contains the aerial with the capacity and inductance distributed throughout its length.

COHERER.—An early form of detector consisting of a contact or collection of contacts which cohere or become relatively conductive under the stimulus of an oscillating potential.

COMPASS RADIO.—Another name for "Direction Finder."

CONDENSER.—A pair of conductors or systems of conductors separated by a thin dielectric suitable for the temporary storage of electric energy.

COUNTERPOISE.—A system of electrical conductors forming one portion of a radiating oscillator, the other portion of which is the aerial. In land stations a counterpoise forms a capacity connection to earth.

COUPLING.—The connection between two circuits by which energy is transferred from one to the other. The connection may be by magnetic, electrostatic or direct coupling, or by any combination of these.

COUPLING, Co-EFFICIENT OF.—In inductively coupled circuits the ratio of the mutual inductance to the square root of the product of the separate self-inductances. The co-efficient of coupling (k) between any two circuits tuned to the same frequency and then coupled is given by the formula :—

$$k = \frac{\lambda_1^2 - \lambda_2^2}{\lambda_1^2 + \lambda_2^2}$$

where λ are the longer and shorter resulting natural wavelengths of the coupled system.

CRYSTAL.—A detector which uses the rectifying properties of the contact between a crystal and a metal surface, or between two crystals.

CYMOMETER.—A “ wave-measurer.”

DAMPING.—The diminution of energy due to the losses which always occur when it is alternating between the static and kinetic forms.

DECREMENT.—The natural logarithm of the constant ratio of the amplitudes of a damped oscillation in successive half periods.

DECREMENTER.—An instrument for measuring decrement.

DETECTOR.—That part of the receiving apparatus which converts the high frequency current into a form which can be perceived visually or by the ear.

DIELECTRIC.—A non-conducting medium through which electric force can act and which is capable of storing electric energy.

DIELECTRIC CONSTANT.—The ratio of the capacity of a condenser with the dielectric as medium to that of the same condenser with air or vacuum as medium.

DIFFRACTION.—The bending of electromagnetic waves into the region of the geometrical shadow of an opaque object over which the ray passes. The amount of diffraction depends on the wavelength, increasing with increase of wavelength.

DIODE.—A two-electrode thermionic valve.

DIPLEX.—The simultaneous transmission and reception of two messages in the same direction between two stations.

DIRECTION FINDER.—A receiving instrument which, in combination with a special aerial system, enables the direction of the transmitting station to be determined.

DISCHARGER.—The piece of transmitting apparatus across the electrodes of which the spark discharge takes place.

DISPLACEMENT CURRENT.—The transient current through a dielectric.

DUPLEX.—The simultaneous transmission and reception of two messages in opposite directions between two stations.

DYNAMO.—A machine for generating continuous E.M.F. by making conductors cut lines of magnetic force. It changes mechanical energy into electrical energy.

DYNATRON.—A triode which depends for its action on the liberation of electrons from the anode by electronic bombardment.

EARTH.—The connection to the earth which in most systems forms the lower extremity of the aerial system.

ELECTRODE.—The end of a metallic conductor in an electric circuit where the current passes to another medium such as liquid or gas.

ELECTROLYSIS.—The splitting up of the molecules of a liquid into positive and negative ions by the passage of an electric current.

ELECTRON.—The natural unit of negative electricity (4.774×10^{-10} electrostatic units).

ELECTROMAGNETIC AND ELECTROSTATIC UNITS.—Are systems of units based on unit magnetic pole and unit electric charge respectively. The ration of the units of one system to that of the other is $V 3 \times 10^{10}$.

ENDODYNE.—Another name for "self-heterodyne."

ETHER.—See *Æther*.

FORM FACTOR.—The form factor of a symmetrical aerial for a given wavelength is the height of the centre of capacity (*i.e.*, the effective height) divided by the actual height.

FREQUENCY.—A term used in connection with any form of rhythmical motion or rhythmical change, denoting the number of complete movements or changes in a given time—usually a second.

FREQUENCY, AUDIO.—See Audio-frequency.

FREQUENCY, BEAT.—See Beat.

FREQUENCY, GROUP.—The frequency of definite variations in amplitude of an alternating current. The spark frequency.

FREQUENCY RADIO.—A frequency higher than the normally audible vibrations, that is, higher than 10,000 cycles per second.

FUNDAMENTAL.—The wave of lowest frequency to which a circuit can be tuned for any particular adjustment.

GALVANOMETER.—An instrument for indicating or measuring an electric current.

GRID.—The controlling electrode of a triode. It is generally in the form of a grid or mesh placed between the cathode and anode.

GROUND.—The American equivalent of "Earth."

HARD.—Applied to thermionic tubes containing an inappreciable amount of gas.

HARMONIC.—A wave whose frequency is a simple multiple of that of the fundamental.

HETERODYNE.—The production of beats by reaction between locally generated oscillations and the received oscillations.

HETERODYNE, SELF.—A receiver in which a triode acts simultaneously as a detector and as a generator of beat-producing oscillations.

HYSTERESIS.—The property of a body which causes the effect of changing conditions to lag behind, and not bear a constant ratio to, these conditions thus causing a loss.

IMPEDANCE.—The opposition to the flow of an alternating current. It is numerically equal to the square root of the sum of the squares of the resistance and the reactance of the circuit.

INDUCTANCE.—The opposition of a circuit (due to the magnetic field linked therewith) to any variation of the current flowing therein.

INTERFERENCE.—The reinforcement or neutralisation of waves arriving at a point along different paths from the same source.

IONISATION.—The formation of ions or charged particles or electrons which facilitate the passage of electricity through a liquid or gas.

JAR.—A capacity of a thousand centimetres.

JIGGER.—The air core transformer used to couple wireless circuits.

KALLIROTRON.—A form of aperiodic retroactive amplifier consisting of two thermionic valves so connected by pure resistances that a rise of grid potential of either produces a fall of grid potential of the other.

KENETRON.—A type of vacuum tube rectifier in which the current is carried entirely by electrons, otherwise a very hard valve.

KATHODE.—See Cathode.

LEYDEN JAR.—A modification of the original form of the condenser.

LEAK GRID.—A high resistance connected across a condenser in series with the grid to limit the potential obtained.

LOOP.—Another name for antinode.

LOGARITHMIC DECREMENT.—See decrement.

MAGNETIC DETECTOR.—A detector depending on the effect of oscillations on the hysteresis of soft iron.

MAGNIFIER NOTE.—A valve in conjunction with an iron core transformer for increasing the amplitude of the audio-frequency current.

MICROPHONE.—An instrument for magnifying sounds consisting of a resistance, usually in the form of an electrical contact, which resistance varies greatly with very small movements such as are produced by sound waves acting on a diaphragm.

NATURAL WAVELENGTH OR FREQUENCY.—Is the wavelength or frequency of the fundamental vibration of the circuit.

NODE.—A point of zero amplitude on a stationary wave.

OSCILLATIONS.—High frequency alternations in tuned circuits.

OSCILLATOR.—A circuit possessing capacity and inductance designed to be easily set into electrical vibration. Also a circuit producing continuous waves by means of a triode valve.

OSCILLOGRAPH.—An apparatus for observing or recording, quickly varying currents or potential differences.

PERIOD.—Any varying quantity which repeats its values regularly at equal time intervals is said to be periodic, and the time-interval of one repetition is called the periodic time or period.

PERMEABILITY.—The ratio of the magnetic flux density produced in any medium by a given magnetomotive force to that produced in a vacuum (or, for practical purposes, in air).

PHASE.—The stage or state to which a periodic variation has proceeded.

PLATE.—The anode of a thermionic tube.

PLIODYNATRON.—A combination of pliotron and a dynatron, being a four-electrode thermionic tube. The output is controlled by the control grid which is between the filament and the heavier grid-anode.

PLIOTRON.—A very hard triode.

POLARISATION.—A voltaic cell is polarised when the passage of the working current has caused such changes at the electrodes as tend to stop the current.

POLARISED RADIATION.—A wave is said to be plane polarised when its electric and magnetic displacements are confined to two planes at right angles. When the plane of the electric and magnetic displacement rotates uniformly with time the waves are said to be circularly polarised.

POTENTIOMETER.—An instrument for adjusting at will the potential between two points.

POWER FACTOR.—Of an A.C. circuit is the ratio of the true to the apparent watts. If the volts and amperes are sinodal the power factor is the cosine of the angle of the phase difference.

QUENCHING.—Devices for cooling the spark gap in the primary of two closely coupled circuits, causing the spark to be extinguishing as soon as the energy has passed over to the secondary circuit, and thus preventing its return.

RADIO.—American equivalent of "wireless." (See also Frequency Radio.)

RADIOGRAM.—A telegram sent by wireless.

RADIOTELEPHONE.—An apparatus for the transmission of speech by wireless.

REACTANCE.—A function of the resistance, inductance, capacity and impressed frequency of a circuit. Also the American equivalent of "choke."

REACTION COIL.—A coil in the plate circuit coupled to the grid circuit which reinforces the received oscillations.

RECEIVER.—The instrument for receiving and rendering perceptible, wireless signals including tuning and detecting circuits.

RECTIFIER.—An apparatus for converting alternating into continuous current, or into pulses of unidirectional current.

REFRACTION.—The change in the direction of propagation of a wave caused by a change in the medium.

RELAY.—An apparatus by means of which a current, too small to perform the required work, is made to control a larger and adequate current.

RESISTANCE.—That property of a conductor which transforms electrical energy into heat.

RESISTANCE AERIAL.—That resistance which (other things being equal) would dissipate the same energy as the aerial radiates.

RESISTANCE CRITICAL.—The limiting resistance beyond which the oscillatory discharge of a circuit passes into an aperiodic discharge.

RESONANCE.—The cumulative effect produced by a periodic force in a circuit of such frequency that the maximum effect is obtained.

RHEOSTAT.—A circuit the resistance of which can be varied so as to control the current passing.

ROOT MEAN SQUARE VALUE.—Is the square root of the sum of the squares of the successive values of the current throughout a half period. It is a measure of the heating value of the current.

SELECTIVITY.—The power of a receiving system to discriminate between a number of simultaneous signals.

SELF-INDUCTION.—Another name for "inductance."

SKIN EFFECT.—Is the name given to the uneven distribution of a high frequency current across the cross-section of a conductor, being greatest at the surface and least at the centre.

SOFT.—Applied to thermionic tubes containing an appreciable amount of gas.

SOLENOID.—A length of wire wound into a coil or helix.

SPARK.—A luminous electrical discharger across a gap.

SPECIFIC INDUCTIVE CAPACITY.—Another name for "dielectric constant."

STATIC.—The American equivalent of "Atmospherics."

STRAYS.—Another name for "Atmospherics."

SYNCHRONOUS.—Means equality of period. Two periodic changes proceeding simultaneously.

SYNTONY.—The adjustment of one circuit to another, or of one transmitter taken as a whole to one receiver taken as a whole, in such a way that their time periods are the same, and waves of a different time period produce little or no effect on the system.

TELEPHONE.—Is the instrument employed in wireless telegraphy to convert current variation into sound.

THERMIONS.—Electrons liberated from an incandescent cathode.

THERMIONIC RECTIFIER.—A Fleming valve or vacuum tube with two electrodes.

TICKER OR TIKKER.—A rapid make-and-break device used in conjunction with a resonant circuit and a pair of telephones, as a receiver for continuous waves.

TONE WHEEL.—A high speed commutator used as a receiver for continuous waves. It is run at a speed slightly different from the synchronous speed for the wave frequency, and in effect converts the high frequency current into a current of audible frequency.

TRAIN OF WAVES.—The waves produced by one discharge of the primary condenser in a spark circuit.

TRANSFORMER.—An apparatus for transferring energy from one circuit to another by magnetic induction. It may or may not alter the potential.

TRIODE.—A three-electrode thermionic tube.

TUNING.—Adjustment of a circuit to synchronism or resonance. Tuning is called sharp when a small difference of frequency produces a large change in the current. The sharpness of tuning depends on the amount of damping in the received waves or in the receiver.

UNDAMPED WAVES.—Having no decrement or damping.

VALVE, TWO-ELECTRODE.—A vacuum tube with a filament and one electrode used as a detector and rectifier for alternating currents.

VALVE, THREE-ELECTRODE.—A vacuum tube with a filament and two electrodes, the grid and plate, used for amplifying and detecting oscillating currents.

VARIOMETER.—A circuit the inductance of which can be continuously varied between certain limits.

WAVE, ELECTRO-MAGNETIC.—A periodic alteration of the electrical condition of the ether.

WAVELENGTH.—The distance (measured in the line of propagation of the wave) between two consecutive maxima of the same sign.

WAVEMETER.—A calibrated circuit of variable frequency with a detector to indicate the position of resonance.

WING CIRCUIT.—Another name for the anode circuit of a triode.

X's.—Another name for "Atmospherics."

FOREIGN EQUIVALENTS.

ENGLISH.	FRENCH.	ITALIAN	SPANISH.	GERMAN.
Accumulator batteries.	Batterie d'accumulateurs	Batterie di accumulatori	Acumuladores, Baterias de	Accumulatoren Batterie
Aerial, balancing . . .	Antenne de compensation	Antenna di compensazione	Antena compensadora . . .	Wage Antenne
Aerial, directional . . .	Antenne dirigée . . .	Antenna dirigibile . . .	Antena dirigida . . .	Gerichtete Antenne
Aerial, direction finder . . .	Antenne de réception dirigée	Antenna rivelatrice della direzione	Antena para busca de direcciones	Antenne, zur Entdeckung der Richtung
Aerial, horizontal . . .	Antenne horizontale . . .	Antenna orizzontale . . .	Antena horizontal . . .	Horizontaler Luftleiter
Aerial, receiving . . .	Antenne de réception . . .	Antenna di ricezione . . .	Antena de recepcion . . .	Empfangsdraht
Aerial, transmitting . . .	Antenne d'émission . . .	Antenna di trasmissione . . .	Antena de transmission . . .	Geberdraht (Sendeluftleiter)
Aerial, umbrella . . .	Antenne en parapluie . . .	Antenna a forma di ombrello	Antena en forma de paragua	Schirmnetz
Alternator . . .	Alternateur . . .	Alternatore . . .	Alternador . . .	Wechselstrom Generator
Alternator, high-frequency . . .	Alternateur à haute fréquence	Alternatore ad alta frequenza	Alternador de alta frecuencia	Hochfrequenz Generator
Ammeter, a.c. . .	Ampèremètre pour courant alternatif	Amperometro per corrente alternata	Amperímetro, c.a. . .	Wechselstromamperemete
Ammeter, d.c. . .	Ampèremètre pour courant continu	Amperometro per corrente continua	Amperímetro, c.c. . .	Gleichstromamperemeter
Ammeter, hot-wire . . .	Ampèremètre à fil chaud	Amperometro a filo caldo	Amperímetro térmico . . .	Hitzdrahtamperemeter
Ammeter, moving coil . . .	Ampèremètre d'Arsonval	Amperometro a bobina mobile	Amperímetro de bobina móvil	D'Arsonvalscher Ampere-meter
Amplifier, thermionic . . .	Amplificateur à lampes . . .	Amplificatore termoionico	Amplificador termoionico	Vakuum-röhren Verstärker
Anode . . .	Anode . . .	Anodo . . .	Anodo . . .	Anode
Antenna . . .	Antenne . . .	Antenna . . .	Antena . . .	Luftleiter (Antenne)
Antenna, horizontal extension of . . .	Branche horizontale de l'antenne	Bracci orizzontali dell'antenna	Antena, Prolongación horizontal de la	Horizontale Verlängerungs-drahte des Luftleiters
Antenna, T-shaped . . .	Antenne en T . . .	Antenna a forma di T . . .	Antena en forma de T . . .	T formige Antenne
Antenna, extended shaped . . .	Antenne en T à branches horizontales prolongées	Antenna a forma di T allungata	Antena en forma de T prolongada	Verlängerte T Luftleiter
Apparatus, receiving . . .	Appareils de réception . . .	Apparecchi di ricezione . . .	Aparatos receptores . . .	Empfänger
Apparatus, transmitting . . .	Appareils de transmission . . .	Apparecchi di trasmissione	Aparatos transmisores . . .	Sender
Arrester, earth terminal . . .	Eclateur de mise à terre . . .	Morsetto per presa di terra	Espacio de chispa de tierra	Unterbrochener schluss
Arrester, lightning . . .	Parafoudre . . .	Dispositivo scaricafulmine	Pararrayos . . .	Blitzschutz
Atmospherics . . .	Perturbations atmosphériques . . .	Perturbazioni atmosferiche	Perturbaciones atmosféricas	Luftstoerungen
Audio frequency . . .	Basse fréquence . . .	Frecuencia acustica . . .	Frecuencia acústica . . .	Ton frequenz

Auto transformer	Auto transformateur	Batterie di bottiglie di Leyda	Autotrasformatore	Bateria de Botellas de Leyden	Auto-transformador	Spartransformator, Sprawlender
Battery of Leyden jars	Batterie de bouteilles de Leyde	Battimenti	Battimenti	Pulsaciones	Batterie Leydener Flaschen	
Beats (Heterodyne)	Battements	Campanello di chiamata	Campanello di chiamata	Timbre de Llamada		
Bell, call-	Sonneries d'appel	Barre collectrici principali	Barre collectrici principali	Barras colectoras principales		Lockklingel
Busbars, main-	Barres omnibus principales	Fabbricato della stazione	Fabbricato della stazione	Edificio de la estación		Haupt Sammelschienen
Building, station-	Bâtiment du poste radio-télégraphique	Vibratore	Vibratore	Zumbador		Stationhaus
Buzzer	Vibrateur	Cicala per la pratica della ricezione a udito	Cicala per la pratica della ricezione a udito	Zumbador para práctica		Summer
Buzzer, practice	Vibrateur d'apprentissage	Capacità	Capacità	Capacidad		Übungssummer
Capacity	Capacité	Capacità di terra	Capacità di terra	Capacidad de tierra		Kapazität
Capacity earth	Contrepoids	Catodo incandescente	Catodo incandescente	Cátado incandescente		Gegengewicht
Cathode, incandescent	Cathode incandescente	Commutazione per ricezione	Commutazione per ricezione	Cambio de conexiones para la recepción		Glühende Kathode
Change of connections for receiving	Commutation pour la réception	Commutazione per trasmissione	Commutazione per trasmissione	Cambio de conexiones para la transmisión		Umschaltung auf Empfangen
Change of connections for transmitting	Commutation pour la transmission	Bobine di protezione a nucleo d'aria	Bobine di protezione a nucleo d'aria	Bobinas de reactancia, protectoras, de núcleo de aire		Umschaltung auf Senden
Chokes, air core protecting	Bobine de réactance sans noyau de fer	Rocchetto d'autoinduzione	Rocchetto d'autoinduzione	Bobina de reactancia		Impedanzspulen für hohe Frequenz mit Luftkern
Choking coil	Bobine d'impédance	Interruttore	Interruttore	Interruptor con apertura y cierre automáticos		Drosselspule
Circuit breaker and closer	Disjoncteur et conjointeur automatique	Circuito oscillante chiuso	Circuito oscillante chiuso	Circuito oscilante cerrado		Strom - unterbrecher und Strom-schliesser
Circuit, closed oscillating	Circuit oscillant fermé	Circuito intermedio	Circuito intermedio	Circuito intermedio		Geschlossener Schwingungskreis
Circuit, intermediate	Circuit intermédiaire	Circuito radiante aperto	Circuito radiante aperto	Circuito radiador abierto		Zwischenkreis
Circuit, open radiating	Circuit radiant ouvert	Circuito oscillante	Circuito oscillante	Circuito oscilante		Offener Strahlungskreis
Circuit, oscillatory	Circuit oscillatoire	Ricevitore a coherer	Ricevitore a coherer	Cohesor		Schwingungskreis
Coherer	Coherer	Rocchetto di sintonizzazione	Rocchetto di sintonizzazione	Bobina de sintonización		Fritterempfang
Coil, syntonising	Inductance de syntonisation	Commutatore	Commutatore	Commutador		Abstimmspule
Commutator	Commuteur	Collettore	Collettore	Colector		Stromwender
Commutator (of Dynamo)	Collecteur	Condensatori	Condensatori	Condensadores		Stromwender
Condensers	Condensateurs	Condensatore regolabile	Condensatore regolabile	Condensador variable		Kondensatoren
Condenser, adjustable	Condensateur réglable	Condensatore a disco regolabile	Condensatore a disco regolabile	Condensador de disco variable		Variabler Kondensator
Condenser, adjustable disc	Condensateur à disque	Condensatore per la sintonizzazione dell'antenna	Condensatore per la sintonizzazione dell'antenna	Condensador de sintonización de la antena		Drehkondensator
Condenser, aerial tuning	Condensateur de syntonisation d'antenne	Condensatore ad aria	Condensatore ad aria	Condensador de dieléctrico de aire		Kondensator zur Luftleiterabstimmung
Condenser, air	Condensateur à air	Condensatore per taratura	Condensatore per taratura	Condensador para calibración		Luftkondensator
Condenser, calibration	Condensateur étalon					Eichungskondensator

FOREIGN EQUIVALENTS—continued.

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Condenser circuit.	Circuit du condensateur.	Circuito del condensatore.	Circuito del condensador.	Kondensatorkreis
Condenser, intermediate circuit	Condensateur du circuit intermédiaire	Condensatore per il circuito intermedio	Condensador del circuito intermedio	Kondensator im Zwischenkreis
Condenser, secondary circuit	Condensateur du circuit secondaire	Condensatore per il circuito secundario	Condensador del circuito secundario	Kondensator im Secundärkreis
Condenser, short wave	Condensateur de raccourcissement	Condensatore per onda corta	Condensador de onda corta	Verkürzungskondensator
Condenser-system	Système di condensateur.	Sistema di condensatori.	Sistema de Condensadores	Kondensatorsystem
Condenser, twin-coupled	Condensateur jumelé	Condensatore a doppio accoppiamento	Condensador de doble acoplamiento	Kondensator, doppel geschaltete
Condensers, variable	Condensateurs réglables	Condensatori variabili	Condensadores variables	Variablerkondensatoren
Converter	Commutatrice	Convertitore	Convertidor	Drehumformer
Continuous wave.	Onde entretenue.	Onda continua	Onda continua	Kontinuierliche Welle
Continuous wave receiver	Récepteur pour ondes entretenues	Ricevitore d'onde smorzate	Receptor para onda continua	Empfänger für kontinuierliche Welle
Coupling	Couplage	Accoppiamento	Acoplamiento	Kopplung
Couplings, flexible and insulating	Manchons d'accouplement souples et isolants	Accoppiamenti elastici ed isolanti	Acoplamientos flexibles y aisladores	Biegsame und isolierende Verbindungen
Current, alternating	Courant alternatif	Corrente alternata	Corriente alterna	Wechselstrom
Current, direct	Courant continu	Corrente continua	Corriente continua	Gleichstrom
Current, primary alternating	Courant alternatif primaire	Corrente alternata del circuito primario	Corriente alterna primaria	Primär Wechselstrom
Cut-out, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Selbstunterbrecher
Cymometers	Cymomètres	Cinometri	Cinómetro	Wellenmesser
Damping, high	Amortissement élevé	Forte smorzamento	Amortiguamiento, Gran	Grosse Dämpfung
Dekremeter	Décrémètre.	Decinmetro	Decinmetro	Dekremeter (Dämpfungsmesser)
Detector, crystal	Détecteur à cristal	Rivelatore di onde a cristallo	Detector de cristal	Krystalldetektor
Detector, Fleming valve	Récepteur à valve d'oscillation "Fleming"	Rivelatore di onde con valvola di Fleming	Detector de Válvula, Fleming	Fleming's Röhrempfänger
Detector, magnetic	Détecteur magnétique	Rivelatore di onde magnetico	Detector magnético	Marconi-Magnetdetektor
Detector, thermo-electric	Détecteur thermo-électrique	Rivelatore di onde termoelettrico	Detector termoelectrico	Thermo-elektrischer-detektor
Dielectric strength	Rigidité diélectrique.	Rigidità dielettrica	Resistencia dieléctrica	Dielektrische Festigkeit
Discharger, asynchronous	Eclateur asynchrone.	Scaricatore asincrono	Descargador asincrono	Scheibenfunkenstrecke, asynchron

Discharger, disc, high-speed	Eclateur à disque à grande-vitesse	Scaricatore a disco ad alta velocità	Descargador de disco de gran velocidad	benfunkenstrecke
Discharger, disc, smooth	Eclateur à disque uni	Scaricatore a disco a con-torni lisci	Descargador de disco liso	Rotierende Scheibenfunkenstrecke, glatt
Discharger, disc, studded	Eclateur à disque—muni de prisonniers latéraux	Scaricatore a disco con-punte	Descargador de disco dentado	Rotierende Scheibenfunkenstrecke mit Zähne
Discharger, fixed	Eclateur fixe	Scaricatore fisso	Descargador fijo	Scheibenfunkenstrecke, fixierter
Discharger, micrometric spark	Eclateur à étincelle micrométrique	Scaricatore per la produzione di scintilla micrometrica	Descargador de chispa micrométrica	Mikrometerfunkenstrecke
Discharger, synchronous	Eclateur synchrone	Scaricatore sincrono	Descargador sincrónico	Scheibenfunkenstrecke, synchron
Duplex telegraphy	Télégraphique duplex	Telegrafia duplex	Telegrafia duplex	Duplex Telegraphie
Earth connection	Connexion de terre	Messa a terra	Conexión de tierra	Erd Verbindung
Efficiency	Rendement	Rendimento	Rendimento	Wirkungsgrad
Electromagnetic coupling	Couplage magnétique	Accoppiamento magnetico	Acoplamiento electrónico magnético	Electromagnetische Kopplung
Electron emission	Emission d'électrodes	Emissione elettronica	Emisión de electrones	Electronenemission
Electrostatic coupling	Couplage statique	Accoppiamento elettrostatico	Acoplamiento electrostático	Electrostatiche Kopplung
Filament battery	Batterie des filaments	Batteria d'accensione dei filamenti	Bateria del filamento	Heizbatterie
Frequency, high	Haute fréquence	Alta frecuencia	Frecuencia, alta	Hochfrequenz
Frequency, low	Basse fréquence	Bassa frecuencia	Frecuencia, baja	Niederfrequenz
Frequency meter	Frequencemètre	Frequenziometro	Frecuencímetro	Frequenzmesser
Generating plant	Générateur	Impianto generatore	Instalación generadora	Stromanlage
Generator, c.c.	Dynamo	Generatore di corrente continua	Generador de corriente continua	Dynamo (Gleichstrom)
Grid	Grille	Griglia	Rejilla	Gitter
Grid circuit	Circuit de grille	Circuito di griglia	Circuito de rejilla	Gitter Kreis
Grid leak	Résistance du circuit de la grille	Reostato del circuito della griglia	Reostato del circuito de la rejilla	Gitter Ableitung
Group frequency	Fréquence des groupes de trains d'ondes	Fréquence dei gruppi di seguiti di onde	Frecuencia de los grupos de sucesiones de ondas	Wellenzuggruppenfrequenz
Hammer-break, magnetic	Interrupteur à marteau	Interruttore magnetico a martello	Interruptor magnético de martillo	Magnetischer Hammerunterbrecher
Heterodyne	Hétérodyne	Eterodina	Heterodina	Überlagerung
Heterodyne receiver	Hétérodyne	Ricevitore a eterodina	Receptor heterodino	Überlagerungs Empfänger

FOREIGN EQUIVALENTS—continued.

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Impedance	Impédance	Impedenza	Impedancia	Scheinbarer Widerstand
Inductance, aerial	Inductance d'antenne	Induttanza dell' antenna	Inductancia de antena	Antenneninduktanz
Inductance, aerial tuning	Inductance à syntoniser le circuit de l'antenne	Induttanza per la sintonizzazione dell' antenna	Inductancia de sintonización de la antena	Induktanz zum Syntonisieren der Antenne
Inductance, low frequency	Bobine d'inductance du circuit à basse fréquence	Induttanza per il circuito a bassa frequenza	Inductancia del circuito de baja frecuencia	Induktanzspule niedriger Frequenzkreis
Inductance, primary	Inductance primaire	Induttanza per circuito primario	Inductancia primaria	Primärinduktanz
Inductance, primary syntonising	Inductance primaire de syntonisation	Induttanza sintonizzatrice del circuito primario	Inductancia de sintonización primaria de	Primärinduktanz zum Abstimmen
Inductance, variable primary syntonising	Inductance primaire variable de syntonisation	Induttanza sintonizzatrice del circuito primario, regolabile	Inductancia variable de sintonización del primario	Veränderliche Primärinduktanz zum Abstimmen
Induction coil	Bobine d'Induction	Rocchetto d'induzione	Bobina de inducción	Rhumkorfischer Funkeninduktor
Insulation	Isolation	Isolamento	Aislamiento	Isolierung
Insulation resistance	Résistance d'isolement	Resistenza d'isolamento	Resistencia de aislamiento	Isolator, Widerstand
Insulator, leading-in	Isolateur d'entrée	Isolatore d'entrata	Aislador de entrada	Isolator, Einführungs
Insulator, flexible	Isolateur souple	Isolatore elastico	Aislador flexible	Flexibler Isolator
Insulator, receiving	Isolateur de réception	Isolatore dell' antenna di ricezione	Aislador para circuito receptor	Isolator für den Empfangsdraht
Insulator, transmitting	Isolateur de transmission	Isolatore dell' antenna di trasmissione	Aislador para circuito transmisor	Isolator für die Senderantenne
Interrupter	Rupteur	Interruttore	Interrupitor	Unterbrecher
Interrupter, current	Rupteur de courant	Interruttore di corrente	Interrupitor de corriente	Stromunterbrecher
Interrupter, electrolytic	Rupteur électrolytique	Interruttore elettrolitico	Interrupitor electrolítico	Wechsel Unterbrecher
Interrupter, turbine	Turbo-rupteur à mercure	Interruttore a turbina	Interrupitor de turbina	Quecksilberturbinenunterbrecher
Jigger	Transformateur d'oscillations	Trasformatore delle correnti oscillatorie	" Jigger "	Jigger, Selbst-induktion des Erregerkreises
Jigger, balanced	Jigger compensé	Trasformatore ad alta frequenza compensato	Jigger compensador	Jigger, balanzierter
Jigger, primary	Primaire de transformateur d'oscillation	Circuito primario del trasformatore delle correnti oscillatorie	" Jigger," primario del	Primär-Jigger
Jigger, secondary	Secondaire de transformateur d'oscillation	Circuito secundario del trasformatore delle correnti oscillatorie	" Jigger " secundario del	Sekundär-Jigger

Key, sending	Manipulateur	Tasto manipolatore di trasmissione	Manipulador	Tasto
Lamp, tuning—and choke	Lampe de Syntonisation avec bobine de réactance	Lampada di sintonizzazione con rocchetto di reazione	Lámpara de sintonización con carrete de reactancia	Syntonisierlampe mit Impedanz
Leyden jar	Bouteille de Leyde	Bottiglia di Leida	Botella de Leyden	Leydener Flasche
Leyden jar, battery of	Batterie de bouteilles de Leyde	Batteria di bottiglie di Leida	Botellas de Leyden, Bateria de	Batterie Leydener Flaschen
Lightning arrester. (See Arrester) lightning-loading coil	Self de syntonisation	Induttanza d'aereo	Inductancia adicional	Verlängerung Spule
Magnetic amplifier	Amplificateur à transformateurs	Amplificatore magnetico	Amplificador magnético	Magnetische Verstärker
Mast, portable	Mât portatif	Albero portatile	Mástil portátil	Tragbarer Mast
Masts, steel sectional	Mâts d'acier à sections	Albero di acciaio diviso in sezioni	Mástil de secciones de acero	Stahlmasten in Teilen
Mast, telescopic	Mât télescopique	Albero telescopico	Mástil telescópico	Teleskopmast
Microphone	Microphone	Microphono	Microfono	Microphon
Microphone apparatus	Appareil microphone	Apparecchio microfonico	Aparato microfónico	Microphon-Apparat
Micrometer, spark	Micromètre à étincelle	Micrometro di Scintilla	Micrometro de chispa	Funkmikrometer
Motor alternator disc set	Groupe moteur alternatif avec éclateur à disque	Gruppo convertitore con scaricatore a disco	Grupo de motor, alternador con estallador de disco	Wechselstromgenerator kombiniert mit Rotierende Funkenstrecke
Multiple antenna	Antenne multiple	Antenna molteplice	Antena múltiple	Mehrfache Antenne
Multiple transmission and reception	Transmission et réception multiples	Trasmmissione e Ricezione multiple	Transmisión y recepción múltiple	Vielfach Übermittlung und Empfang
Oscillations, electric	Oscillations électriques	Oscillazioni elettriche	Oscilaciones eléctricas	Elektrische-Schwingungen
Oscillating valve	Oscillateur à lampes	Valvola oscillante	Valvula oscilatoria	Röhre sender
Oscillatory circuit	Circuit oscillant	Circuito oscillante	Circuito oscilante	Schwingungs Kreis
Overload	Surcharge	Sovracarica	Sobrecarga	Überlast
Plant, radiotelegraphic	Installation radiotélégraphique	Impianto radiotelegrafico	Instalación radiotelegráfica	Radiotelegraphische Anlage
Plate	Plaque, Anode	Placa	Placa	Anod, Platte
Plate circuit	Circuit de plaque	Circuito della placa	Circuito de placa	Anoden Kreis
Potentiometer	Potentiomètre	Potenzíometro	Potenciómetro	Potentiometer
Radiating antenna	Antenne transmettrice	Antenna irradiante	Antena radiadora	Strahlende Antenne
Radio frequency	Haute fréquence	Radio frecuencia	Frecuencia radio	Radio frequenz

FOREIGN EQUIVALENTS—continued.

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Radiogoniometer . . .	Radiogoniomètre . . .	Radiogoniometro . . .	Radiogoniometro . . .	Radiogoniometer . . .
Range . . .	Portée . . .	Portata . . .	Alcance . . .	Reichweite . . .
Reactance . . .	Réactance . . .	Reattanza . . .	Reactancia . . .	Inductive Widerstand . . .
Reaction coupling . . .	Couplage à réaction . . .	Accoppiamento di reazione . . .	Acoplamiento de reacción . . .	Rück Kopplung . . .
Receiver . . .	Appareil récepteur . . .	Apparecchio ricevitore . . .	Receptor . . .	Empfänger . . .
Receiver arrangement . . .	Dispositif de réception . . .	Dispositivo di ricezione . . .	Dispositivo de recepción . . .	Empfangsvorrichtung . . .
Receiver, balanced . . .	Récepteur compensé . . .	Ricevitore compensato . . .	Receptor compensador . . .	Empfänger, bilanzierter . . .
Receiver, flexible . . .	Récepteur souple . . .	Ricevitore flessibile . . .	Receptor flexible . . .	Empfänger . . .
Receiver, vacuum valve . . .	Récepteur à valve d'oscillation . . .	Ricevitore con valvola a vuoto . . .	Receptor de válvula de vacío . . .	Röhrempfänger . . .
Rectifiers . . .	Rectificateurs . . .	Raddrizzatori di corrente . . .	Rectificador . . .	Ausgleicher . . .
Relay . . .	Relais . . .	Soccorritore . . .	Relevador . . .	Relais . . .
Relay H.T. . . .	Relais pour haute tension . . .	Soccorritore ad alta tensione . . .	Relevador A.T. . . .	Hochspannungrelais . . .
Relay magnets . . .	Aimants du relais . . .	Magneti di soccorritore . . .	Imanes del relevador . . .	Relais-magnete . . .
Resistance, high . . .	Haute résistance . . .	Alta resistenza . . .	Resistencia, alta . . .	Hoher Widerstand . . .
Resistance, low . . .	Basse résistance . . .	Bassa resistenza . . .	Resistencia, baja . . .	Niedriger Widerstand . . .
Resistance, starting . . .	Rhéostat de démarrage . . .	Reostato di avviamento . . .	Reostato de arranque . . .	Anlasser . . .
Resistance regulating . . .	Rhéostat de champ . . .	Reostato di campo . . .	Resistencia de regulación . . .	Regulierwiderstand . . .
Screening box . . .	Boîte de garde . . .	Cassetta di protezione . . .	Caja de resguardo . . .	Schutzkasten . . .
Series rheostat . . .	Rhéostat en série . . .	Reostato in serie . . .	Reostato en serie . . .	Serien Widerstand . . .
Ship station . . .	Station de bord . . .	Stazione di bordo . . .	Estación de á bordo . . .	Schiffstation . . .
Short circuiting device . . .	Dispositif de mise en court circuit . . .	Dispositivo di messa in corto circuito . . .	Dispositivo de corto circuito . . .	Kurzschliesser . . .
Shunt, highly inductive . . .	Shunt à pouvoir inductif élevé . . .	Shunt ad alta induzione . . .	Shunt altamente inductivo . . .	Shunt mit hohe Selbstinduktion . . .
Shunt, non-inductive . . .	Shunt non-inductif . . .	Circuito in derivazione non-induttivo . . .	Shunt, no inductivo . . .	Nebenschluss, induktionsfreier . . .
Signals, balancing . . .	Signaux équilibrés . . .	Segnali equilibrati . . .	Señales compensadoras . . .	Balanciersignale . . .
Signals, telephone . . .	Signaux téléphoniques . . .	Segnali del telefono . . .	Señales telefónicas . . .	Telephonsignale . . .
Spark . . .	Étincelle . . .	Scintilla . . .	Chispa . . .	Funkc . . .
Spark coil, with hammer-break . . .	Bobine d'induction à interrupteur à marteau . . .	Rochetto d'induzione a martello . . .	Bobina de chispa con interruptor de martillo . . .	Funkeninduktor mit Hammerunterbrecher . . .
Spark gap . . .	Eclateur à étincelle . . .	Scaricatore . . .	Estallador de chispa . . .	Funkenstrecke . . .
Spark gap, micrometric . . .	Eclateur à intervalle micrométrique . . .	Scaricatore micrometrico . . .	Estallador micrometrico . . .	Micrometer Funkenstrecke . . .
Spark micrometer . . .	Micromètre à étincelles . . .	Micrometro di scintilla . . .	Micrómetro de chispa . . .	Funkenmikrometer . . .
Spark gap, multiple . . .	Eclateur en série . . .	Scaricatore multiplo . . .	Espacio de chispa múltiple . . .	Unterteilte Funkenstrecke . . .

Spark gap, quenched . . .	Eclateur pour étincelle étouffée . . .	Scaricatore per oscillazioni smorzate . . .	Descargador de oscilación extinguida . . .	Funkentstrecke . . .
Spark quenched . . .	Étincelle étouffée . . .	Scintilla smorzata . . .	Chispa extinguida . . .	Löschfunke . . .
Sparking distance . . .	Distance explosive . . .	Distanza esplosiva . . .	Distancia explosiva . . .	Funkentstrecke . . .
Specific inductive capacity . . .	Capacité inductive spécifique . . .	Capacità induttiva specifica . . .	Capacidad inductiva específica . . .	Dielektrizitäts Konstante . . .
Starter, automatic . . .	Démarrreur automatique . . .	Avviatore automatico . . .	Reostato de arranque automático . . .	Selbstanlasser . . .
Starter, combined with shunt regulator . . .	Rhéostat de démarrage avec rhéostat de champ . . .	Reostato di avviamento combinato con regolatore in derivazione . . .	Reost to de arranque y regulador de campo combinados . . .	Anlasswiderstand mit Nebenschlussregler . . .
Starter, single-phase . . .	Démarrreur monophasé . . .	Avviatore per corrente monofase . . .	Reostato de arranque monofásico . . .	Einphasenanlasser . . .
Starter, three-phase . . .	Démarrreur tri-phasé . . .	Avviatore per corrente trifase . . .	Reostato de arranque trifásico . . .	Dreiphasenanlasser . . .
Station, aeroplane . . .	Aéroplane (poste d') . . .	Stazione per aeroplano . . .	Estación para aeroplano . . .	Flugzeug Station . . .
Station, airship . . .	Station de ballon dirigeable . . .	Stazione per aeronave . . .	Estación para globos dirigibles . . .	Luftschiffstation . . .
Station, high-power . . .	Station à grande puissance . . .	Stazione di grande potenza . . .	Estación de gran potencia . . .	Kraftstation . . .
Station, landing . . .	Poste de débarquement . . .	Stazione da sbarco . . .	Estación de desembarco . . .	Landungsstation . . .
Station, long-distance . . .	Poste de grandes distances . . .	Stazione ultrapotente . . .	Estación de gran alcance . . .	Radiotelegraphische Grossstation . . .
Station, portable . . .	Station portative . . .	Stazione portatile . . .	Estación portátil . . .	Tragbarestation . . .
Station, portable military . . .	Poste militaire transportable . . .	Stazione militare mobile . . .	Estación militar portátil . . .	Tragbare Militärstation . . .
Station, radiotelegraph . . .	Poste radiotélégraphique . . .	Stazione radiotelegrafica . . .	Estación radiotelegráfica . . .	Funkenamts Kleinstation . . .
Station, small-power . . .	Station à faible puissance . . .	Stazione di piccola potenza . . .	Estación de pequeña potencia . . .	Funkenamts Kleinstation . . .
Swiss commutator . . .	Commutateur suisse . . .	Commutatore tipo svizzero . . .	Commutador suizo . . .	Schweizerische Kommutator . . .
Switch, aerial change-over . . .	Commutateur d'antenne . . .	Commutatore dell'antenna . . .	Commutador para cambio de hilos de antena . . .	Luftdrahtumschalter . . .
Switch, aerial heating . . .	Commutateur d'échauffement d'antenne . . .	Interruttore per riscaldamento dell'antenna . . .	Commutador de seguridad contra calentamiento de la antena . . .	Umschalter zum heizen der Antenne . . .
Switch, automatic . . .	Interrupteur automatique . . .	Interruttore automatico . . .	Interruptor automático . . .	Selbsttätiger Schalter . . .
Switch, automatic field break . . .	Interrupteur automatique d'excitation . . .	Interruttore automatico di eccitazione . . .	Interruptor automático del campo . . .	Selbsttätiger Magnetausschalter . . .
Switch, carbon break . . .	Interrupteur à contacts de charbon . . .	Interruttore a carbone . . .	Interruptor con contactos de carbón . . .	Kohlenschalter . . .
Switch, change-over . . .	Commutateur . . .	Commutatore . . .	Commutador . . .	Umschalter . . .
Switch, change-tune . . .	Commutateur de longueurs d'ondes . . .	Commutatore di sintonizzazione . . .	Commutador de sintonización . . .	Wellenumschalter . . .
Switch, charging . . .	Interrupteur de charge . . .	Interruttore di carica . . .	Commutador de carga . . .	Ladeschalter . . .
Switch, combined fuse and . . .	Interrupteur avec coupe circuit . . .	Fusibile ed interruttore combinati . . .	Interruptor con fusible . . .	Schalter und Sicherungskombiniert . . .
Switch, double-bladed knife . . .	Interrupteur bipolaire à lames . . .	Interruttore doppio a coltello . . .	Interruptor de cuchillo bipolar . . .	Doppelmesserschalter . . .

FOREIGN EQUIVALENTS—continued

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Switch, double-pole	Interrupteur bipolaire	Interruttore bipolare	Interruptor bipolar	Zweipoliger Schalter
Switch, double double throw	Commutateur bipolaire à deux directions	Interruttore bipolare a doppio effetto	Commutador bipolar dos posiciones	Zweipoliger Umschalter
Switchboard, d.c. and a.c.	Tableau de distribution pour courant continu et alternatif	Quadro di distribuzione per corrente continua ed alternata	Cuadro de distribución de c.a. y c.c.	Schalttafel fuer Gleich und Wechselstrom
Switch, field-break	Interrupteur de l'excita- tion	Interruttore ad eccita- zione	Interruptor del campo	Magnetausschalter
Switch, high-tension	Interrupteur pour haute tension	Interruttore per alta ten- sione	Interruptor de alta ten- sión	Hochspannungsschalter
Switch, high-tension remote control	Téléinterrupteur pour haute tension	Interruttore ad alta ten- sione comandato a dis- stanza	Teleinterruptor de alta tensión	Hochspannungsfern- schalter
Switch, knife.	Interrupteur unipolaire à lames	Interruttore a coltello	Interruptor de cuchillo	Messerschalter
Switch, main.	Interrupteur principal	Interruttore principale	Interruptor principal	Hauptschalter
Switch, oil-break.	Interrupteur à bain d'huile	Interruttore ad olio	Interruptor con baño de aceite	Oelschalter
Switch, press (toggle)	Interrupteur à pression	Interruttore a pressione	Interruptor de tornillo	Druckschalter
Switch, quick-break	Interrupteur à rupture brusque	Interruttore a scatto rapido	Interruptor de rotura brusca	Momentschalter
Switch, single-pole	Interrupteur unipolaire	Interruttore unipolare	Interruptor monopolar	Einpoligerschalter
Switch, three-phase	Interrupteur pour cou- rant tri-phasé	Interruttore tripolare	Interruptor trifásico	Drehstromschalter
Switch, three-way	Commutateur à trois directions	Commutatore a tre vie	Commutador de tres pasos	3 Wege Umschalter
Switch, voltmeter	Interrupteur du volta- mètre	Interruttore per volt- metro	Interruptor para volti- metro	Voltmeterumschalter
Switch, wave-changing	Commutateur pour changement de longueur d'onde	Commutatore d'onda.	Commutador de cambio de onda	Wellen Umschalter
Syntonisation	Syntonisation	Sintonizzazione	Sintonización	Abstimmung
Tapper	Frappeur	Decoherer	Decoherer	Klopfer
Telegraphy, wireless	Radiotélégraphie dirigée	Radiotelegrafia a sistema dirigibile	Telegrafia sin hilos diri- gida	Gerichtete Drahtlose Tele- graphie
Three-electrode valve.	Lampe à trois electrodes	Valvola a tre elettrodi	Valvula de tres electrodos	Vakuum röhre mit drei electroden

Trailing aerial	Antenne pendante (pour avion)	Coda d'aéro	Antena colgante	Freihängende Antenne
Transformer	Transformateur	Trasformatore	Transformador	Transformator
Transformer, high-frequency oscillation	Transformateur d'oscillation à haute fréquence	Trasformatore d'oscillazioni ad alta frequenza	Transformador de oscilaciones de alta frecuencia	Umfomer fuer Hochfrequenzschwingungen
Transformer, oscillatory	Transformateur d'oscillation	Trasformatore delle oscillazioni	Transformador oscilatorio	Oscillationsumformer
Transmitting arrangement	Dispositif d'émission	Dispositivo di trasmissione	Dispositivo de transmisión	Senderanordnung
Transmitter, cavalry	Transmetteur pour cavalerie	Trasmettitore di stazione per cavalleria	Transmisor para estación de cavaleria	Kavalleriesendeapparat
Transmitter, inductive	Transmetteur à couplage inductif	Trasmettitore ad accoppiamento induttivo	Transmisor de acoplamiento de induccion	Gekoppelte Sender
Transmitter, sharply tuned	Transmetteur, à syntonisation aiguë	Trasmettitore acutamente sintonizzato	Transmisor de sintonización aguda	Scharf abgestimmte Sender
Transmitter, simple (P.A.)	Dispositif d'émission directe	Trasmettitore semplice	Transmisor sencillo	Einfacher Sender
Tube, ebonite	Tube en ébonite	Tubo di ebanite	Tubo de ebonita	Ebonitroehre
Tuning	Syntonisation	Sintonizzazione	Sintonización	Abstimmen
Tuning, flat	Syntonisation non aigue	Sintonizzazione piana	Sintonización aplastada	Unscharfes Abstimmen
Tuner, multiple	Syntonisateur multiple	Sintonizzatore multiplo	Sintonizador multiple	Vielefach Abstimmaparat
Tuning, note	Hauteur de la note	Sintonizzazione della nota	Sintonización de la nota	Tonhöhe der Abstimmung
Tuning, note and wave	Note et onde de syntonisation	Sintonizzazione della note e dell'onda	Sintonización de la nota y de la onda	Abstimmen von Tonhöhe und Welle
Tuning wave	Onde de syntonisation	Onda di Sintonizzazione	Onda de Sintonización	Abstimmungswelle
Two or three valve amplifier	Amplificateur à deux ou trois lampes	Amplificatore a due o tre valvole	Amplificador de dos ó tres valvulas	2 oder 3 Röhrenverstärker
Undamped wave.				
Continuous wave.)				
Valve	Valve, Lampe	Valvola	Válvula	Röhre
Valve, vacuum	Valve à vide	Valvola a vuoto	Válvula de vacío	Vakuumröhre
Voltage	Voltage	Potenziale	Voltaje	Spannung
Voltmeter, a.c.	Voltmètre pour courant alternatif	Voltmetro per corrente alternata	Voltmetro c.a.	Voltmeter für Wechselstrom
Voltmeter, aperiodic	Voltmètre apériodique	Voltmetro aperiódico	Voltímetro aperiódico	Aperioidisches Voltmeter
Voltmeter, d.c.	Voltmètre pour courant continu	Voltmetro per corrente continua	Voltímetro c.c.	Voltmeter für Gleichstrom
Voltmeter, hot-wire	Voltmètre à fil chaud	Voltmetro a filo caldo	Voltímetro térmico	Hitzdrahtvoltmeter
Voltmeter, switch	Interrupteur de voltmètre	Interruttore per voltmetro	Voltímetro, interruptor para	Voltmeterumschalter
Wave frequency	Fréquence des ondes	Frequenza dell'onda	Frecuencia de onda	Wellen frequenz
Wavelength	Longueur d'onde	Lunghezza d'onda	Longitud de onda	Wellenlänge
Wavemeter	Ondemètre	Ondametro	Ondámetro	Wellenmesser
Waves, radiation of	Radiation des ondes	Irraggiamento di onde	Radiación de las ondas	Ausstrahlung der Wellen

GENERAL INFORMATION AND USEFUL
TABLES

INTERNATIONAL RULES FOR THE USE OF SYMBOLS*

* Extracted from the report of the International Electrotechnical Commission.

- (a) Instantaneous values of electrical quantities which vary with the time to be represented by small letters. In case of ambiguity they may be followed by the subscript "t."
(b) Virtual or constant values of electrical quantities to be represented by capital letters.
(c) Maximum values of periodic electrical and magnetic quantities to be represented by capital letters followed by the subscript "m."
(d) In cases where it is desirable to distinguish between magnetic and electric quantities, constant or variable, magnetic quantities to be represented by capital letters of either script, heavy-faced or any special type. Script letters to be only employed for magnetic quantities.
(e) Angles to be represented by small Greek letters.
(f) Dimensions and special quantities to be represented, wherever possible, by small Greek letters.

I.—QUANTITIES.

Name of Quantity.	Symbol.	Name of Quantity.	Symbol.
Length	<i>l</i>	Resistance	<i>R</i>
Mass	<i>m</i>	Resistivity	ρ
Time	<i>t</i>	Conductance	<i>G</i>
Angles	$\alpha, \beta, \gamma \dots$	Quantity of electricity	<i>Q</i>
Acceleration of gravity	<i>g</i>	Flux-density, electrostatic	<i>D</i>
Work	<i>A</i>	Capacity	<i>C</i>
Energy	<i>W</i>	Dielectric constant	ϵ
Power	<i>P</i>	Self-inductance	<i>L</i>
Efficiency	η	Mutual inductance	<i>M</i>
Number of turns in unit of time	<i>n</i>	Reactance	<i>X</i>
Temperature Centigrade	<i>t</i>	Impedance	<i>Z</i>
Temperature absolute	<i>T</i>	Reluctance	<i>S</i>
Period	<i>T</i>	Magnetic flux	Φ
$2\pi/T$	ω	Flux-density, magnetic	<i>B</i>
Frequency	<i>f</i>	Magnetic field	<i>H</i>
Phase displacement	ϕ	Intensity of Magnetisation	<i>J</i>
Electromotive force	<i>E</i>	Permeability	μ
Current	<i>I</i>	Susceptibility	κ

II.—UNITS. SIGNS FOR NAMES OF UNITS.

Signs for names of Electrical Units to be employed only after numerical values :—

Name of Unit.	Sign.	Name of Unit.	Sign.
Ampere	<i>A</i>	Volt-coulomb	VC
Volt	<i>V</i>	Watt-hour	Wh
Ohm	Ω	Volt-ampere	VA
Coulomb	<i>C</i>	Ampere-hour	Ah
Joule	<i>J</i>	Milliampere	mA
Watt	<i>W</i>	Kilowatt	kW
Farad	<i>F</i>	Kilovolt-ampere	kVA
Henry	<i>H</i>	Kilowatt-hour	kWh

m—Sign for milli- μ —Sign for micro- or micr- k—Sign for kilo- M—Sign for mega- or meg.

* As a sign for the ohm, one of the two letters O or Ω is recommended. The letter Ω should no longer be used for megohm.

III—MATHEMATICAL SYMBOLS AND RULES.

Name.	Symbol.	Name.	Symbol.
Total differential	d	Ratio of circumference to diameter	π
Partial differential	δ	Summation	Σ
Base of Napierian logarithms	e	Summation, integral	/
Imaginary $\sqrt{-1}$	i		

Ordinary numerals as exponentials shall exclusively be used to represent powers. (In consequence, it is desirable that the expression $\sin^{-1}x$, $\tan^{-1}x$, employed in certain countries be expressed by $\arcsin x$, $\arctan x$.)

The comma and the full-stop shall be employed for separating the decimals according to the custom of the country, but the separation between any three digits constituting a whole number shall be indicated by a space and not by a full-stop or a comma (1 000 000).

For the multiplication of numbers and geometric quantities, indicated by two letters, it is recommended to use the sign \times , and the full-stop only when there is no possible ambiguity.

To indicate division in a formula, it is recommended that the horizontal bar or the colon be employed. Nevertheless the oblique line may be used when there is no possibility of ambiguity; when necessary, ordinary brackets $()$, square brackets $[\]$, and braces $\{ \}$, may be employed to obtain clearness.

IV—ABBREVIATIONS FOR WEIGHTS AND MEASURES.

Length:—m; km; dm; cm; mm; $\mu=0.001$ mm. Surface:—a; ha; m²; km²; dm²; cm²; mm². Volume:—l; hl; dl; cl; ml; m³; km³; dm³; cm³; mm³. Mass:—g; t; kg; dg; cg; mg.

V—NAME FOR ELECTRICAL UNIT.

The name "Siemens" has been recommended for the unit of conductance.

SYMBOLS FOR MULTIPLES AND SUB-MULTIPLES.

Multiple or Sub-Multiple.	Name	Symbol.	Multiple or Sub-Multiple.	Name	Symbol.
10^6	Mega	M	10^{-6}	Micro	μ
10^3	Kilo	k	10^{-9}	Millimicro	m μ
10^{-3}	Milli	m	10^{-12}	Pico	p or $\mu\mu$

The old usage of $\mu\mu$ as an abbreviation for 10^{-9} metre is undesirable. The prefix Billi- is sometimes used instead of Millimicro-.

WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

drachms.	oz.	lb.	grs.	cwts.	ton.	grammes.
1 = 0.0625	= 0.0039	= 0.000139	= 0.000035	= 0.00000174	= 1.771846	
16 = 1	= 0.0625	= 0.00223	= 0.000558	= 0.000028	= 28.34954	
256 = 16	= 1	= 0.0357	= 0.00893	= 0.000447	= 453.59	
7168 = 448	= 28	= 1	= 0.25	= 0.0125	= 12,700	
28672 = 1792	= 112	= 4	= 1	= 0.05	= 50,802	
573440 = 35840	= 2240	= 80	= 20	= 1	= 1,016,048	

METRIC SYSTEM OF WEIGHTS AND MEASURES.

The Metric System is based upon the estimated length of the fourth part of a terrestrial meridian. The ten-millionth part of this arc is called a *Metre*, and is the unit of length. The cube of the tenth part of a metre was adopted as the unit of capacity, and denominated a *Litre*. The weight of a litre of distilled water at its greatest density was called a *Kilogramme*, of which the thousandth part, or *Gramme*, was adopted as the unit of weight. The multiples of these, proceeding in decimal progression, are distinguished by the employment of the prefixes *deca*, *hecto*, *kilo*, and *myria*, and the subdivision by *deci*, *centi*, and *milli*. The units in general use are as follows:—

MEASURES OF LENGTH (UNIT METRE).

Equal to	Metre.	Inches.	Feet.	Yards.	Mile.
Millimetre	0.001	0.039	0.003	0.001	0.00
Centimetre	0.010	0.393	0.032	0.010	0.000
Metre	1.000	39.370	3.280	1.093	0.000
Kilometre	1000.000	39370.790	3280.899	1093.633	0.62

CUBIC, OR MEASURES OF CAPACITY (UNIT LITRE).

Equal to	Cubic inches.	Cubic feet.	Pints.	Gallons.
Cubic Centimetre	0.061	0.000	0.001	0.000
Litre, or cubic decimetre	61.027	0.035	1.760	0.220
Cubic Metre	61027.051	35.316	1760.773	220.096

MEASURES OF WEIGHT (UNIT GRAMME).

Equal to	Grains.	Avoirdupois lb.	Cwt. = 112 lb.	Tons = 20 cwt.
Milligramme	0.015	0.000	0.000	0.0000
Gramme	15.432	0.002	0.000	0.0000
Kilogramme	15432.348	2.204	0.019	0.0009
Tonne = 1,000 kilogs.	—	2204.000	19,678	0.9839

SQUARE OR SURFACE MEASURE.

Equal to	Square feet.	Square yards.
Square Metre	10.7643	1.196
Hectare = 10,000 sq. met. =	11,960 sq. yds. = 2.47 acres.	

NAUTICAL MEASURES

(From "Lloyd's Calendar," by permission of the Committee of Lloyd's.)

12 inches	= 1 foot	6 feet	= 1 fathom
3 feet	= 1 yard	3 nautical miles	= 1 league

Sea or Nautical Mile = one-sixtieth of a degree of latitude, and varies from 6,046 ft. on the Equator to 6,092 ft. in lat. 60°

Nautical Mile for speed trials, generally called the Admiralty Measured Mile	$\left\{ \begin{array}{l} 6,080 \text{ feet} \\ 1.151 \text{ statute miles} \\ 1,853 \text{ metres} \end{array} \right.$
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Cable's length = the tenth of a nautical mile; or, approximately, 100 fathoms or 200 yards.

A Knot = a nautical mile an hour, is a measure of speed, but is not infrequently, though erroneously, used as synonymous with a nautical mile.

Length of European Measures of Distances compared with the Nautical Mile of 6,080 ft.

	Length in Nautical Miles.		Length in Nautical Miles.
Nautical Mile	1.000	German Ruthen	4.064
British Statute Land Mile	0.868	Italian Mile	1.000
Austrian Mile	4.094	Norwegian Mile	6.097
Danish Mile	4.064	Russian Verst	0.576
French Kilometre	0.539	Swedish Mile	5.769
German Geographical Mile	4.000		

DISTANCE OF HORIZON AT SEA.

Let h be the height of the observer's eye above sea level, D the distance to the horizon, and R the earth's radius.

Then

$$D^2 = 2Rh$$

And thus

$$D \text{ in statute miles} = 1.22 \sqrt{h} \text{ in feet}$$

$$D \text{ in kilometres} = 2.52 \sqrt{h} \text{ in metres}$$

An object of height h^1 is seen by an eye at height h at a distance D^1 given by

$$D^1 \text{ in statute miles} = 1.22 \sqrt{h} \text{ in feet} + \sqrt{h^1} \text{ in feet}$$

$$D^1 \text{ in kilometres} = 2.52 \sqrt{h} \text{ in metres} + \sqrt{h^1} \text{ in metres}$$

The distance of the horizon—i.e., the greatest distance at which the surface of the sea is visible—varies somewhat with refraction in the atmosphere.

LENGTH OF A DEGREE IN LATITUDE AND LONGITUDE.

Lat. °	Degree of Longitude.		Degree of Latitude.		Lat. °	Degree of Longitude.		Degree of Latitude.	
	Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.		Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.
0	69.160	60.000	68.698	59.600	45	48.986	42.498	69.044	59.899
2	0.119	59.964	0.699	0.601	47	47.251	40.993	0.068	0.920
4	68.992	0.855	0.702	0.603	49	45.459	39.439	0.092	0.941
6	0.783	0.673	0.706	0.607	51	43.611	37.835	0.116	0.962
8	0.491	0.419	0.712	0.612	53	41.710	36.186	0.140	0.982
10	0.116	0.093	0.719	0.618	55	39.758	34.491	0.162	60.002
12	67.659	58.697	0.728	0.625	57	37.756	32.755	0.185	0.022
14	0.120	0.229	0.738	0.634	59	35.707	30.979	0.206	0.041
16	66.499	57.690	0.750	0.645	61	33.615	29.164	0.228	0.059
18	65.797	0.081	0.764	0.657	63	31.481	27.311	0.248	0.077
20	0.015	56.404	0.779	0.669	65	29.308	25.425	0.268	0.094
22	64.154	55.657	0.795	0.683	67	27.100	23.509	0.286	0.110
24	63.216	54.843	0.813	0.699	69	24.857	21.564	0.302	0.124
26	62.201	53.962	0.831	0.715	71	22.582	19.593	0.318	0.137
28	61.110	0.016	0.850	0.731	73	20.282	17.597	0.333	0.149
30	59.944	52.005	0.870	0.749	75	17.956	15.578	0.345	0.161
32	58.706	50.931	0.892	0.767	77	15.607	13.539	0.357	0.171
34	57.396	49.794	0.914	0.786	79	13.238	11.484	0.367	0.179
36	56.016	48.597	0.936	0.806	81	10.853	9.417	0.375	0.186
38	54.568	47.340	0.959	0.826	83	8.456	7.338	0.381	0.192
40	53.053	46.026	0.983	0.846	85	6.048	5.248	0.387	0.196
42	51.473	44.656	69.007	0.866	87	3.632	3.151	0.390	0.199
44	49.830	43.231	0.013	0.888	89	1.211	1.050	0.392	0.201

STANDARD OR ZONE TIME.

Country.	Central Meridian.	Fast or Slow on Greenwich Time.*
Western Europe, Algeria	0°	Greenwich Time
Central Europe, Tunis, Congo, Angola, South-West Africa	15° E.	1 h. fast
Eastern Europe, British South Africa, Egypt, Portuguese East Africa	30° E.	2 h. fast
Mauritius, Reunion and Seychelles	60° E.	4 h. fast
India (except Calcutta) and Ceylon	82½° E.	5½ h. fast
Calcutta	90° E.	6 h. fast
Burmah	97½° E.	6½ h. fast
Federated Malay States, Straits Settlements, and French Indo-China	105° E.	7 h. fast
Java	100° 48' 37.5" E.	7 h. 19 m. 14.5 s. fast
Western Australia, Hong-Kong, East Coast of China, Kiau Chau, Philippine Islands, British North Borneo, Labuan Korea	120° E.	8 h. fast
Japan, Seoul, and Chemulpo	127° 30' E.	8½ h. fast
South Australia and Guam	135° E.	9 h. fast
New South Wales, Queensland, Tasmania, Victoria, New Guinea, and Caroline Islands	142° 30' E.	9½ h. fast
New Zealand	150° E.	10 h. fast
Ascension	172½° E.	11½ h. fast
Iceland, Madeira, Liberia and Portuguese Guinea	14° 15' W.	57 m. slow
America :	15° W.	1 h. slow
Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, Grenada, Trinidad, etc.)	60° W.	4 h. slow
Eastern (Eastern U.S., Chili, Panama, Peru, etc.)	75° W.	5 h. slow
Central	90° W.	6 h. slow
Mountain	105° W.	7 h. slow
Pacific (British Columbia, etc.)	120° W.	8 h. slow
Alaska	135° W.	9 h. slow
Hawaii or Sandwich Islands	157° 30' W.	10½ h. slow
Samoa	172½° W.	11½ h. slow

* Greenwich time is used in France, Spain, Portugal, Belgium, Gibraltar, and the Faroes.

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS.—I.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4
	0.0	0.00	0.07	0.31	0.03	0.62	0.07	0.94	0.12	1.25
1	0.78	3.14	0.95	3.45	0.13	3.77	1.32	4.08	1.53	4.39
2	3.14	6.28	3.46	6.59	3.80	6.91	4.15	7.22	4.52	7.53
3	7.06	9.42	7.54	9.74	8.04	10.05	8.55	10.36	9.07	10.68
4	12.56	12.56	13.20	12.88	13.85	13.19	14.52	13.50	15.20	13.82
5	19.63	15.70	20.42	16.02	21.23	16.33	26.06	16.65	22.90	16.96
6	28.27	18.84	29.22	19.16	30.19	19.47	31.17	19.79	32.16	20.10
7	38.48	21.99	39.59	22.30	40.71	22.61	41.85	22.93	43.00	23.24
8	50.26	25.13	51.53	25.44	52.81	25.76	54.10	26.07	55.41	26.38
9	63.61	28.27	65.03	28.58	66.47	28.90	67.92	29.20	69.30	29.53
10	78.53	31.41	80.11	31.73	81.71	32.04	83.32	22.35	84.94	32.67

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS.—II.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9
0	0.19	1.57	0.28	1.88	0.38	2.19	0.50	2.51	0.63	2.82
1	1.76	4.71	2.01	5.02	2.26	5.34	2.54	5.65	2.83	5.96
2	4.90	7.85	5.30	8.16	5.72	8.48	6.15	8.79	6.60	9.11
3	9.62	10.99	10.17	11.30	10.75	11.62	11.34	11.93	11.94	12.25
4	15.90	14.13	16.61	14.45	17.34	14.76	18.09	15.08	18.85	15.39
5	23.75	17.37	24.63	17.59	25.51	17.90	26.42	18.22	27.33	18.53
6	33.18	20.42	34.21	20.73	35.25	21.04	36.31	21.36	37.39	21.67
7	44.17	23.56	45.36	23.87	46.56	24.19	47.78	24.50	49.01	24.81
8	46.74	26.70	58.08	27.01	59.44	27.33	60.82	27.64	62.21	27.96
9	70.88	29.84	72.38	30.15	73.89	30.47	75.42	30.78	76.97	31.10
10	86.59	32.98	88.24	33.30	89.92	33.61	91.60	33.92	93.31	34.24

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS.

No.	Square.	Cube.	Sq. root.	Cube root.
1	1	1	1.0	1.0
2	4	8	1.414	1.259
3	9	27	1.732	1.442
4	16	64	2.0	1.587
5	25	125	2.236	1.709
6	36	216	2.449	1.817
7	49	343	2.645	1.912
8	64	512	2.828	2.0
9	81	729	3.0	2.080
10	100	1,000	3.162	2.154
11	121	1,331	3.316	2.223
12	144	1,728	3.464	2.289
13	169	2,197	3.60	2.35
14	196	2,744	3.74	2.41
15	225	3,375	3.87	2.46
16	256	4,096	4.0	2.51
17	289	4,913	4.12	2.57
18	324	5,832	4.24	2.62
19	361	6,859	4.35	2.66
20	400	8,000	4.47	2.71
21	441	9,261	4.582	2.758
22	484	10,648	4.690	2.802
23	529	12,167	4.795	2.843
24	576	13,824	4.898	2.884
25	625	15,625	5.0	2.92
26	676	17,576	5.099	2.962
27	729	19,683	5.196	3.0
28	784	21,952	5.291	3.036
29	841	24,381	5.385	3.072
30	900	27,000	5.47	3.10
31	961	29,799	5.567	3.141

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS—continued.

No.	Square.	Cube.	Sq. root.	Cube root.
32	1,024	32,768	5.656	3.174
33	1,089	35,937	5.744	3.207
34	1,156	39,304	5.830	3.239
35	1,225	42,875	5.91	3.27
36	1,296	46,656	6.0	3.301
37	1,369	50,653	6.082	3.332
38	1,444	54,872	6.164	3.361
39	1,521	59,319	6.244	3.391
40	1,600	64,000	6.32	3.419
41	1,681	68,921	6.403	3.448
42	1,764	74,088	6.480	3.476
43	1,849	79,507	6.557	3.503
44	1,936	85,184	6.633	3.530
45	2,025	91,125	6.708	3.55
46	2,116	97,336	6.782	3.583
47	2,209	103,823	6.855	3.608
48	2,304	110,592	6.928	3.634
49	2,401	117,649	7.0	3.659
50	2,500	125,000	7.07	3.68
51	2,601	132,651	7.141	3.708
52	2,704	140,608	7.211	3.732
53	2,809	148,877	7.280	3.756
54	2,916	157,464	7.348	3.779
55	3,025	166,375	7.41	3.80
56	3,136	175,616	7.483	3.825
57	3,249	185,193	7.549	3.848
58	3,364	195,112	7.615	3.870
59	3,481	205,379	7.681	3.892
60	3,600	216,000	7.74	3.91
61	3,721	226,981	7.810	3.936
62	3,844	238,328	7.874	3.957
63	3,969	250,047	7.937	3.979
64	4,096	262,144	8.0	4.0
65	4,225	274,625	8.06	4.02
66	4,356	287,496	8.124	4.041
67	4,489	300,763	8.185	4.061
68	4,624	314,432	8.246	4.081
69	4,761	328,509	8.306	4.101
70	4,900	343,000	8.36	4.12
71	5,041	357,911	8.426	4.140
72	5,184	373,248	8.485	4.160
73	5,329	389,017	8.544	4.179
74	5,476	405,224	8.602	4.198
75	5,625	421,875	8.66	4.21
76	5,776	438,976	8.717	4.235
77	5,929	456,533	8.774	4.254
78	6,084	474,552	8.831	4.272
79	6,241	493,039	8.888	4.290
80	6,400	512,000	8.94	4.30
81	6,561	531,441	9.0	4.326
82	6,724	551,368	9.055	4.344
83	6,889	571,787	9.110	4.362
84	7,056	592,704	9.165	4.379
85	7,225	614,125	9.21	4.39
86	7,396	636,056	9.273	4.414
87	7,569	658,053	9.327	4.431
88	7,744	681,472	9.380	4.447
89	7,921	704,969	9.433	4.464
90	8,100	729,000	9.48	4.480
91	8,281	753,571	9.539	4.497
92	8,464	778,688	9.591	4.514
93	8,649	804,357	9.643	4.530
94	8,836	830,584	9.695	4.546
95	9,025	857,375	9.74	4.560
96	9,216	884,736	9.797	4.578
97	9,409	912,673	9.848	4.594
98	9,604	941,192	9.899	4.610
99	9,801	970,299	9.949	4.626
100	10,000	1,000,000	10.00	4.64
105	11,025	1,157,625	10.24	4.718
110	12,100	1,331,000	10.48	4.79
115	13,225	1,520,875	10.72	4.863
120	14,400	1,728,000	10.95	4.93
125	15,625	1,953,125	11.18	5.000
130	16,900	2,197,000	11.40	5.26

SQUARES, CUBES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS—*continued.*

No.	Square.	Cube.	Sq. root.	Cube root.
135	18,225	2,460,375	11·61	5·130
140	19,600	2,744,000	11·83	5·19
150	22,500	3,375,000	12·24	5·31
160	25,600	4,096,000	12·64	5·42
170	28,900	4,913,000	13·03	5·53
180	32,400	5,832,000	13·41	5·64
190	36,100	6,859,000	13·78	5·74
200	40,000	8,000,000	14·14	5·84
210	44,100	9,261,000	14·49	5·94
220	48,400	10,648,000	14·83	6·03
230	52,900	12,167,000	15·16	6·12
240	57,600	13,824,000	15·47	6·21
250	62,500	15,625,000	15·81	6·29
260	67,600	17,576,000	16·12	6·38
270	72,900	19,683,000	16·43	6·46
280	78,400	21,952,000	16·73	6·54
290	84,100	24,389,000	17·02	6·61
300	90,000	27,000,000	17·32	6·69
310	96,100	29,791,000	17·60	6·76
320	102,400	32,768,000	17·88	6·83
330	108,900	35,937,000	18·16	6·91
340	115,600	39,304,000	18·43	6·97
350	122,500	42,875,000	18·70	7·04
360	129,600	46,656,000	18·97	7·11
370	136,900	50,653,000	19·23	7·17
380	144,400	54,872,000	19·49	7·24
390	152,100	59,319,000	19·74	7·30
400	160,000	64,000,000	20·00	7·36
410	168,100	68,921,000	20·24	7·42
420	176,400	74,088,000	20·49	7·48
430	184,900	79,507,000	20·73	7·54
440	193,600	85,184,000	20·97	7·60
450	202,500	91,125,000	21·21	7·66
460	211,600	97,366,000	21·44	7·71
470	220,900	103,823,000	21·67	7·77
480	230,400	110,592,000	21·90	7·82
490	240,100	117,649,000	22·13	7·88
500	250,000	125,000,000	22·36	7·93
510	260,100	132,651,000	22·58	7·98
520	270,400	140,608,000	22·80	8·04
530	280,900	148,877,000	23·02	8·09
540	291,600	157,464,000	23·23	8·14
550	302,500	166,375,000	23·45	8·19
560	313,600	175,616,000	23·66	8·24
570	324,900	185,193,000	23·87	8·29
580	336,400	195,112,000	24·08	8·33
590	348,100	205,379,000	24·29	8·38
600	360,000	216,000,000	24·49	8·43
610	372,100	226,981,000	24·69	8·48
620	384,400	238,328,000	24·90	8·52
630	396,900	250,047,000	25·099	8·572
640	409,600	262,114,000	25·298	8·617
650	422,500	274,625,000	25·495	8·662
660	435,600	287,496,000	25·690	8·706
670	448,900	300,763,000	25·884	8·750
680	462,400	314,432,000	26·076	8·793
690	476,100	328,509,000	26·267	8·836
700	490,000	343,000,000	26·457	8·879
710	504,100	357,911,000	26·645	8·921
720	518,400	373,248,000	26·832	8·962
730	532,900	389,017,000	27·018	9·004
740	547,600	405,224,000	27·202	9·045
750	562,500	421,875,000	27·386	9·085
760	577,600	438,976,000	27·568	9·125
770	592,900	456,533,000	27·748	9·165
780	608,400	474,552,000	27·928	9·205
790	624,100	493,039,100	28·106	9·244
800	640,000	512,000,000	28·284	9·283
820	672,400	551,368,000	28·635	9·359
840	705,600	592,704,000	28·982	9·435
860	739,600	636,056,000	29·325	9·509
880	774,400	681,472,000	29·664	9·582
900	810,000	729,000,000	30·000	9·654
1,000	1,000,000	1,000,000,000	31·622	10·000

INDUCTANCE OF SINGLE LAYER COILS

$$L = \pi^2 d^2 n^2 l k \times 10^{-3}$$

L = Inductance of coil in μH .

l = Length of coil in cms.

d = Diameter of coil.

n = Number of turns per cm.

k = Factor which depends on the ratio of the diameter to the length of the coil.

If the total number of turns of wire are used instead of the number of turns per cm. the formula may be written

$$L = \frac{\pi^2 d^2 n^2 K}{l}$$

Where N is the total number of turns.

The total length of wire in the coil is $\pi d n$, so that a third form is

$$L = \frac{x^2}{l} K.$$

Where $x = \pi d n$.

The values of k , for the ratio of length to diameter of the coil between 0.01 and 10 have been calculated by Prof. Nagaoka. The values are given in the table:

INDUCTANCE AND CAPACITY. TABLE I.

d.		K.	d.		K.
$\frac{l}{d}$			$\frac{l}{d}$		
0.00	..	1.000	0.70	..	0.7609
0.02	..	0.9916	0.72	..	0.7556
0.04	..	0.9832	0.74	..	0.7504
0.06	..	0.9750	0.76	..	0.7452
0.08	..	0.9668	0.78	..	0.7401
0.10	..	0.9588	0.80	..	0.7351
0.12	..	0.9509	0.82	..	0.7301
0.14	..	0.9430	0.84	..	0.7252
0.16	..	0.9353	0.86	..	0.7205
0.18	..	0.9276	0.88	..	0.7157
0.20	..	0.9201	0.90	..	0.7110
0.22	..	0.9126	0.92	..	0.7063
0.24	..	0.9053	0.94	..	0.7018
0.26	..	0.8980	0.96	..	0.6972
0.28	..	0.8909	0.98	..	0.6928
0.30	..	0.8838	1.00	..	0.6884
0.32	..	0.8767	1.20	..	0.6475
0.34	..	0.8699	1.40	..	0.6115
0.36	..	0.8632	1.60	..	0.5795
0.38	..	0.8565	1.80	..	0.5511
0.40	..	0.8499	2.00	..	0.5255
0.42	..	0.8433	2.2	..	0.5025
0.44	..	0.8369	2.4	..	0.4816
0.46	..	0.8306	2.6	..	0.4626
0.48	..	0.8243	2.8	..	0.4452
0.50	..	0.8181	3.0	..	0.4292
0.52	..	0.8120	3.5	..	0.3944
0.54	..	0.8060	4.0	..	0.3654
0.56	..	0.8001	4.5	..	0.3409
0.58	..	0.7943	5.0	..	0.3198
0.60	..	0.7885	6.0	..	0.2854
0.62	..	0.7828	7.0	..	0.2584
0.64	..	0.7772	8.0	..	0.2366
0.66	..	0.7717	9.0	..	0.2185
0.68	..	0.7663	10.0	..	0.2033

For making approximate calculations of the inductance of a coil, Table 2 has been worked out. This table gives the inductance of coils of diameters ranging from 4 to 18 cms. in diameter, and from 1 to 34 cms. long.

The inductance given is for a winding of 10 turns per centimetre. For other windings the values given in the table should be multiplied by $\frac{N^2}{100}$ where N is the number of turns per centimetre.

In Table 3 are given the number of turns per centimetre for coils wound with various covered wires. These figures have been worked out from the diameters given in the catalogue of a leading wire manufacturer, and in many cases checked on actual coils. They must, however, be regarded as approximate only, since the number of turns per centimetre depends on the skill of the winder and the overall dimensions of the covered wire, which is not absolutely constant.

Subject to these limitations the table will be found to give very good results for approximate work.

INDUCTANCE OF A COIL WOUND WITH 10 TURNS PER CENTIMETRE.

DIAMETER IN CENTIMETRES.

Length in cms.	4	5	6	7	8	9
1	5.78	7.89	10.14	12.49	14.94	17.47
2	16.59	23.28	30.5	38.1	46.2	54.5
3	29.5	42.25	56.02	70.87	86.57	97.15
4	43.4	63.0	84.57	107.9	132.8	159.0
5	58.0	84.92	115.0	147.6	179.6	220.3
6	72.9	107.6	146.7	190.2	236.2	300.2
7	87.9	130.7	179.3	233.1	291.2	353.7
8	103.3	154.2	212.5	277.2	348.0	423.7
9	118.7	177.8	246.1	322.7	406.0	470.5
10	134.2	201.8	280.0	368.0	464.5	568.5
12	165.2	249.3	348.7	460.5	586.0	717.5
14	196.4	298.2	418.2	554.0	702.5	868.7
16	227.7	347.2	478.8	648.2	825.2	1023
18	259.0	395.7	557.8	743.0	950.0	1178
20	290.5	444.7	628.0	838.0	1074	1333
22	321.7	493.7	698.5	933.5	1205	1490
24	353.5	543.0	752.0	1038.7	1322	1647
26	384.0	591.7	820.0	1125	1447	1845
28	416.5	641.2	910.5	1221	1572	1961
30	448.0	690.2	980.5	1316	1697	2120
32	480.0	739.5	1052	1413	1822	2278
34	511.0	788.7	1122	1509	1948	2380

Length in cms.	10	12	14	16	18
1	20.06	—	—	—	—
2	63.1	81.12	99.7	119.5	139.7
3	120.0	155.8	196.0	233.0	273.7
4	186.3	243.5	305.2	369.5	436.0
5	259.2	342.2	430.7	502.3	620.5
6	337.5	448.2	567.5	698.7	823.7
7	420.2	560.7	711.7	873.2	1046
8	504.0	676.7	863.5	1062	1278
9	590.5	800.7	1020	1256	1512
10	679.5	920.2	1181	1464	1762
12	860.7	1175	1518	1886	2283
14	1046	1435	1862	2329	2822
16	1234	1701	2219	2785	3400
18	1424	1970	2577	3245	3962
20	1615	2241	2945	3715	4547
22	1807	2515	3312	4187	5140
24	2000	2790	3682	4667	5735
26	2194	3067	4057	5152	6342
28	2421	3347	4432	5637	6952
30	2582	3625	4807	6125	7565
32	2778	3905	5187	6615	8182
34	2982	4187	5565	7162	8800

COIL OF MAXIMUM INDUCTANCE.

In winding an inductance it is desirable in most cases to make its resistance as small as possible, since in this case the length of wire will also be a minimum. It is not possible to give a single formula for winding the dimensions of a coil with maximum inductance in every case, since the value of the inductance depends on the correction terms for thickness of insulation, etc. The original formula given by Maxwell is that if the section of the coil is square the maximum inductance is obtained when the mean diameter of the coil is 3.7 times the side of the square.

In a recent article Messrs. Shawcross & Wells have given curves of the inductance obtained for a wire 1 mm. in diameter and 1570.8 (500π) metres long, coiled up in different forms. The coil of maximum inductance for a square section coil is that from the curves with diameter about three times the side of the square.

The square section coil has a greater inductance than coils of other ratios of width b to depth c .

Thus the inductance for the square section coil is 1.29 henrys (approx.).

For a ratio $\frac{b}{c} = 2$ the maximum inductance is 1.24 henrys and is for a ratio $\frac{d}{b}$ about 2.3.

For $\frac{b}{c} = 5$ max. inductance = 1.07 henrys ; for $\frac{d}{b} = 1.5$.

Dr. A. Russell has pointed out that for maximum possible inductance from a given length of wire the section of the coil should be circular, and with a ratio $a = 2.575r$, where a is the radius of the circular axis of the coil, and r is the radius of the cross-section.

The inductance is

$$L = 5.35\pi N^2 a \times 10^{-9} \text{ henrys.}$$

where N = total number of turns.

For a single-layer coil for the case where the turns are close-wound the coil of maximum inductance is given by $\frac{\text{diameter}}{\text{breadth}} = 2.415$.

This can be seen by plotting a curve of the inductance as calculated by Nagaoka's formula.

When the coil is wound with spaced windings the inductance will depend on the spacing, and therefore it must be worked out for any particular case from the formulas given.

SINGLE-LAYER COILS.

S.W.G.	Single silk covered.				Double silk covered.		
	Diameter in millimetres.	Turns per centimetre.	Relative inductance.	Direct Current resistances.	Turns per centimetre.	Relative inductance	Direct Current resistance.
1	2	3	4	5	6	7	8
40	0.122	62.2	9.67	28.4	55.9	7.81	25.5
39	0.132	58.8	8.64	22.9	52.8	6.97	20.5
38	0.152	52.3	6.84	15.3	47.6	5.66	13.9
37	0.173	47.5	5.63	10.8	43.5	4.74	9.90
36	0.193	43.3	4.69	7.89	40.0	4.00	7.29
35	0.213	40.0	4.00	5.96	36.1	3.26	5.38
34	0.234	36.8	2.39	4.57	33.6	2.82	4.18
33	0.254	33.2	2.75	3.49	31.5	2.48	3.31
32	0.274	32.0	2.56	2.91	29.6	2.19	2.67
31	0.295	30.0	2.24	2.35	27.9	1.94	2.18
30	0.315	28.2	1.99	1.93	25.5	1.63	1.74
29	0.345	25.8	1.66	1.47	23.7	1.40	1.35
28	0.376	23.9	1.43	1.15	22.1	1.22	1.06
27	0.417	21.8	1.19	0.853	20.3	1.03	0.794
26	0.457	20.0	1.00	0.649	18.7	0.874	0.607
25	0.508	18.2	0.828	0.478	17.1	0.731	0.449
24	0.559	16.7	0.697	0.363	15.7	0.616	0.341
23	0.610	15.2	0.578	0.277	14.3	0.511	0.261
22	0.711	13.2	0.436	0.177	12.8	0.410	0.171
21	0.813	11.6	0.337	0.115	11.1	0.308	0.114
20	0.914	10.35	0.268	0.0840	9.9	0.245	0.0803
19	1.016	9.37	0.219	0.0616	9.05	0.205	0.0595
18	1.219	7.87	0.155	0.0359	7.64	0.146	0.0349
17	1.422	6.87	0.118	0.0231	6.50	0.106	0.0218
16	1.626	5.87	0.086	0.0151	6.75	0.083	0.0148
15	1.829	5.23	0.068	0.0106	5.16	0.066	0.0105
14	2.032	4.76	0.057	0.00782	4.65	0.054	0.0076
13	2.337	4.13	0.043	0.00513	4.09	0.040	0.00508
12	2.642	3.68	0.034	0.0036	3.66	0.033	0.0036

Columns 4 and 7 give the ratio of inductance of a coil wound with the given wire to that of a similar coil wound with 20 turns per centimetre (Table 2).

The resistances in columns 5 and 8 are for a length of 1 centimetre winding on a coil of 10 cms. diameter.

Enamelled wire has approximately the same dimensions as single silk covered in the smaller gauges.

INDUCTANCE OF COILS WITH IRON CORES.

The formulas for inductance given in the previous formulas have been for coils without magnetic cores.

The inductance of these coils depends principally on the geometrical dimensions, with a small correction factor depending on the frequency of the current, so that there are formulas available for every possible case, many being of the highest accuracy.

For coils with iron cores, however, the inductance depends on the physical properties of the core as well as the dimensions of the coil, and these properties are variable. The flux density B , which is induced in a sample of iron by a magnetising force H , is given by relationship

$$B = \mu H$$

where μ is the permeability.

Now, μ is not a constant for any one sample, but varies in a complex manner with H and also varies within wide limits for different samples of iron.

The inductance of an iron core coil, therefore, depends on the permeability of the iron, and this varies over the cross-section of the core, since H is not constant over the area. Moreover, if the current in the coil (by which H is produced) varies, the value of μ will change.

It is, therefore, only possible to select some average value for μ which can be taken by experience to give a representative value for the particular coil in question.

Where the coil is in such a form that the iron forms are nearly closed circuit with a relatively small air gap, a convenient formula is

$$L \text{ (henrys)} = \frac{0.4 N^2 \mu A}{l}$$

in which μ is the permeability of the air gap ($\mu = 1$). l is the length of the air gap in centimetres, A is the cross-section normal to the flux at the gap (the area of the surface of the iron core at the air gap), N is the total number of turns on the coil.

For an open-core coil a similar formula which may be used is

$$L = \frac{N^2 A \mu}{l} k$$

where N = total number of turns, l = length of the iron core, A = cross-section of the core μ = the permeability of the value of H at the centre of the core, and k is a factor to be determined by experiment or from previous data to allow for the effect of the ends. The area A is strictly of that of the iron in the core after allowing for air spaces or insulation between the strips or wires of which the iron is composed, but if the same iron be used for various coils, the outside area of the core is taken from the difference allowed for in k .

CALCULATION OF CAPACITY.

The capacities given by the following formulas are in microfarads. The farad is 10^{-9} of the cgs. electromagnetic unit and is defined as the capacity of a condenser charged to a potential of 1 volt by 1 coulomb of electricity. In the formulas here given all lengths are expressed in centimetres and all areas in square centimetres.

PARALLEL PLATE CONDENSER.

Let S = surface area of one plate.

r = thickness of the dielectric,

K = dielectric constant ($K = 1$ for air).

$$C = 0.0885 K \frac{S}{r} \text{ microfarads.}$$

If, instead of a single pair of metal plates, there are N similar plates the dielectric between, alternate plates being connected in parallel,

$$C = 0.0885K \frac{(N-1)S}{r}$$

In these formulas no allowance is made for the curving of the lines of force at the edges of the plates; the effect is negligible where r is very small compared with S .

VARIABLE CONDENSER WITH SEMI-CIRCULAR PLATES.

Let N = total number of parallel plates.

r_1 = outside radius of the plates.

r_2 = inner radius of plates.

r = thickness of dielectric

K = dielectric constant.

Then, for the position of maximum capacity (movable plates between fixed plates).

$$C = 0.1390K \frac{(N-1)(r_1^2 - r_2^2)}{r}$$

This formula does not take into account the effect of the edges of the plates, but as the capacity is also affected by the containing case it will not generally be worth while to take the edge effect into account.

WAVELENGTH AND FREQUENCY OF RESONANCE.

$$\lambda_{cm} = 1.8838 \times 10^{11} \sqrt{LC} \text{ (cgs. electromagnetic units).}$$

$$= 6.283 \sqrt{L \text{ cgs. electromagnetic } C \text{ cgs. electrostatic.}}$$

$$\lambda_m = 0.05957 \sqrt{L \text{ cgs. electromagnetic } C \text{ micromicrofarad.}}$$

$$= 1.884 \sqrt{L \text{ microhenry } C \text{ micromicrofarad.}}$$

$$= 1884 \sqrt{L \text{ microhenry } C \text{ microfarad.}}$$

$$= 59570 \sqrt{L \text{ millihenry } C \text{ microfarad.}}$$

$$= 1884000 \sqrt{L \text{ henry } C \text{ microfarad.}}$$

$$f = \frac{159.2}{\sqrt{L \text{ henry } C \text{ microfarad.}}}$$

$$= \frac{5033}{\sqrt{L \text{ millihenry } C \text{ microfarad.}}}$$

$$= \frac{159200}{\sqrt{L \text{ microhenry } C \text{ microfarad.}}}$$

$$\omega = \frac{1000}{\sqrt{L \text{ henry } C \text{ microfarad.}}}$$

$$= \frac{31620}{\sqrt{L \text{ millihenry } C \text{ microfarad.}}}$$

$$= \frac{1,000,000}{\sqrt{L \text{ microhenry } C \text{ microfarad.}}}$$

$$T = \frac{1}{f} = \frac{2\pi}{\omega}$$

$$\lambda_m = \frac{2.998 \times 10^8}{f}$$

$$= \frac{1.884 \times 10^9}{\omega}$$

MATHEMATICAL CONSTANTS AND FORMULÆ.

Ratio of circumference to diameter of circle $\pi = 3.1416$

$$\frac{\pi}{2} = 1.5708 \quad \frac{4}{3}\pi = 4.1888 \quad \frac{1}{\pi} = 0.3183$$

$$\frac{\pi}{4} = 0.78508 \quad \pi^2 = 9.870 \quad \sqrt{\pi} = 1.772$$

$$4\pi = 12.566 \quad \pi^3 = 31.01 \quad \sqrt{\pi} = 1.465$$

ANGLES.

$$1 \text{ degree} = \frac{\pi}{180} \text{ radian} = 0.01745 \text{ radian.}$$

$$1 \text{ radian} = \frac{180}{\pi} \text{ degrees} = 57^\circ 0.2958$$

$$= 57^\circ 17' 14'' = 206,265 \text{ seconds.}$$

LOGARITHMS.

Base of natural logarithms $e = 2.71828$, $1/e = 0.3679$, $e^2 = 7.3890$.

To convert—

natural logarithms to common, multiply by $\log_{10} e = 0.43429$
 common logarithms to natural, multiply by 2.3026.

CAPACITY OF ANTENNÆ.

For a single wire of length l , and diameter d , suspended at a height h above the ground, the capacity is

$$C = \frac{0.2416l}{\log_{10} \frac{4h}{d} + \log_{10} \left(\frac{l/2 + \sqrt{l^2/4 + d^2/4}}{l/2 + \sqrt{l^2/4 + 4h^2}} \right)}$$

Usually the diameter d may be neglected in comparison with the length l , and the following equations are convenient for numerical computations.

$$\text{For } \frac{4h}{l} = 1, \\ <$$

$$C = \frac{0.2416l}{\log_{10} \frac{4h}{d} - k_1}$$

$$\text{For } \frac{l}{4h} = 1, \\ <$$

$$C = \frac{0.2416l}{\log_{10} \frac{2l}{d} - k_2}$$

in which the quantities

$$k_1 = \log_{10} \left(\frac{1 + \sqrt{1 + \left(\frac{4h}{l} \right)^2}}{2} \right)$$

and

$$k_2 = \log_{10} \left(\frac{l}{4h} + \sqrt{1 + \left(\frac{l}{4h} \right)^2} \right)^2$$


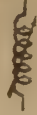











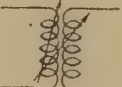





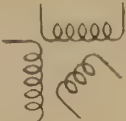

















may be interpolated from Table 6.

TABLE 6.

$4h/l$	k_1	$l/4h$	k_2
0	0	0	0
0.1	0.001	0.1	0.043
0.2	0.004	0.2	0.086
0.3	0.009	0.3	0.128
0.4	0.016	0.4	0.169
0.5	0.025	0.5	0.209
0.6	0.035	0.6	0.247
0.7	0.045	0.7	0.283
0.8	0.057	0.8	0.318
0.9	0.069	0.9	0.351
1.0	0.082	1.0	0.383

GRAPHICAL SYMBOLS FOR RADIO DIAGRAMS.

	Aerial—Elevated.		Switch—Multi-way.
	Aerial—Horizontal or Buried.		Switch—Plug.
	Aerial—Directional.		Plug.
	Terminal.		Key—Morse Tapping.
	Wires—Twisted Pair.		Key—Morse, Back Contact.
	Connection—Electrical Joint.		Relay.
	Bridge—Crossing.		Detector—Crystal.
	Earth.		Coherer.
	Counterpoise.		Tikker.
	Cell. (The long thin stroke represents the Positive Terminal.)		Detector—Magnetic.
	Battery—L.T.		Rectifier. (Electron Current Flow assumed from Point to Plate.)
	Battery—H.T.		Vacuum Tube—Non-filament.
	Condenser—Large, Audio, Frequency.		Valve—Tube Thermionic.
	Condenser—Fixed Radio Frequency.		Valve Tube—Thermionic, 3-Electrode.
	Condenser—Variable (continuously) Radio Frequency.		Valve—Tube Thermionic, 4-Electrode.
	Telephones.		Lamp—Bulb Electric Filament
	Telephone—Loud Speaking.		Spark Gap—Open.
	Microphone—Telephone Transmitter.		Spark Gap—Quenched.
	Link.		Spark Gap—Rotary, Synchronous.
	Fuse.		Spark Gap—Rotary, Asynchronous.
	Switch—Single-way.		Lightning Arrester.

	Arc—Open.		Inductance—Variable.
	Arc—Enclosed.		Direction—From.
	Arc—Generator.		Direction—Towards.
	Generator—D.C.		Direction.
	Generator—Alternating.		Coupling—Inductive.
	Motor.		Coupling—Inductive, Variable.
	Coupling—Mechanical.		Coupling—Inductive, Variable, one Inductance Variable.
	Ammeter.		Coupling—Inductive, Variable (Alternative).
	Milliammeter.		Variometer.
	Microammeter.		Radiogoniometer.
	Voltmeter.		Transformer—Iron Core.
	Galvanometer.		Coupling—Autotransformer.
	Decremeter.		Choke Coil—Iron Core.
	Wattmeter.		Magnet—Electro.
	Frequencymeter.		Vibrator—Buzzer Make and Break.
	Microfaradmeter.		
	Wavemeter.		
	Thermoammeter.		
	Resistance—Fixed.		
	Resistance—Variable.		
	Potentiometer Resistance.		
	Inductance.		

PARTICULARS OF COMPANIES ENGAGED IN THE COMMERCIAL DEVELOPMENT OF WIRELESS TELEGRAPHY & TELEPHONY

Aktieselskabet Darotco Dansk Radiotelegraf- & Telefon Compagni (formerly Internationalt Radiotelegraf— & Telefron Compagni (Irotco).

Registered.—June 30th, 1920, and June 30th, 1923.

Head Office.—Sct. Annaegaard, Dronningensgade 68, Copenhagen C.

Engineer's Office and Laboratory.—Prinsessegade 29B, Copenhagen C.

Directors.—H. Siegumfeldt (Chairman), C. Skibsted, K. Carlsen, H. W. Schwartz, Capt. H. Brun, Commander H. Haagensen, H. A. Wahnöe, W. A. Peters.

Capital.—Danish crowns, 150,000.

The Company was formed for the purpose of the construction and manufacture of radiotelegraphic and radiotelephonic apparatus of all kinds for land, as well as sea and air.

Amalgamated Wireless (Australasia), Ltd.

Incorporated.—July 11th, 1913, in the State of New South Wales.

Head Office.—"Wireless House," 97, Clarence Street, Sydney, New South Wales.

Melbourne Office.—Wireless House, 422/4, Chancery Lane, Melbourne; and Collins House, Collins Street, Melbourne, Victoria.

New Zealand Office.—"Australasia Chambers," Customs House Quay, Wellington, New Zealand.

Directors.—Sir William Vicars, C.B.E., Rt. Hon. W. M. Hughes, K.C., E. T. Fisk, Esq., Member I.R.E., C.P. Bartholomew, Esq., G. Mason Allard, Esq., F.C.P.A. (Chairman), Capt. T. Langley-Webb, J. Stinson, Esq.

Managing Director.—Ernest T. Fisk.

Assistant Manager and Secretary.—J. F. Wilson, A.C.I.S.

Accountant.—F. W. Larkins, A.I.I.A., A.C.I.S.

Transocean Radio Service:—Chief Engineer, Traffic Manager, and other Executives to be appointed.

Coastal Radio Service:—Manager.—L. A. Hooke. **Superintendent.**—G. Weston.

Marine Radio Service:—Traffic Manager.—J. L. Mulholland. **Equipment Manager.**—D. Campbell.

Radio Concert Service:—Temporary Staff.

Radio Electric Works:—Manager. S. M. Grime. Assistant Manager. E. A. Horner.

Technical, Research and Patents Department:—Superintendent.—G. Apperley.

Branch Managers.—L. A. Hooke, Victoria. G. Robertson, New Zealand.

Capital.—Authorised, £1,000,000. Subscribed capital issued, June 30th, 1922:

181,400 Fully paid shares	£181,400 0 0
804,118 Shares paid to 2s.	80,411 16 0

£261,811 16 0

The Company has acquired an exclusive and perpetual licence to use and exploit in Australia and New Zealand, together with certain rights in other British territories in the Pacific and Indian Oceans, the present and future patents of Marconi's Wireless Telegraph Company, Ltd., London, and Radio Corporation of America, as well as the Telefunken system, and a prominent French system. It also has rights to the patents of the Poulsen Pedersen arc system.

Of the 1,000,000 ordinary shares, 500,001 shares are held by the Commonwealth Government. The Board consists of seven Directors, three appointed by the Government, three appointed by the private shareholders, and a seventh Director elected by a majority vote of the other six, or appointed by arbitration. In September, 1922, the Prime Minister of the Commonwealth, Rt. Hon. W. M. Hughes, K.C., was nominated by the Cabinet for the position of seventh Director, and unanimously elected by the other Directors.

An agreement was made in March, 1922, between the Commonwealth Government and the Company, providing for the establishment of direct wireless communication between Australia and Great Britain; feeder services between the main trunk station and the capital city of every State; re-organisation and re-equipment of the existing coastal service, and for the future development of all branches of wireless communication within Australia and between Australia and countries over seas. In the event of an outbreak of war, the entire organisation of the Company will become a unit of the defence forces of the Commonwealth.

The Company has an extensive manufacturing works in Sydney, in which all classes of radio apparatus, including electronic valves, are produced; it owns and operates 28 wireless stations within the Commonwealth and its territories, in addition to 200 stations on board Australian and New Zealand ships.

Accounts.—The accounts are made up to June 30th in each year. The profit and loss account for the twelve months ended June 30th, 1923, shows that the gross profit from trading and revenue from wireless stations amounted to £68,666 12s. 8d., and after deducting all expenses and providing for reserves, there was a net profit of £142 11s. 8d. The reserve accounts at June 30th, 1923, stood at £52,895 2s. 5d.

Dividends.—1913-14, 4 per cent. 1914-15, 6 per cent. 1915-16, 5 per cent. 1916-17, 5 per cent. 1917-18, 5 per cent. 1918-19, 5 per cent. 1919-20, 5 per cent. 1920-21, 6 per cent. 1921-22, 6 per cent.

American Radio and Research Corporation

Incorporated.—June 15th, 1915.

Head Office.—Medford Hillside, Massachusetts.

District Offices.—303, Tremont Building, Boston, Mass. 21, Park Row, New York City, N.Y. 219, Fox Croft Building, San Francisco, Calif. 203, S. Dearborn Street, Chicago, Ill. 322, Chambers Building, Kansas City, Missouri. 4,835, Woodward Avenue, Detroit, Michigan. 40, South Seventh Street, Philadelphia, Pa. 31, Exchange Street, Rochester, N.Y. 204, Medical Arts Building, Dallas, Texas. 1,306, Keenan Building, Pittsburg, Pa. 201, Kasota Building, Minneapolis, Minn. 2,414, Federal Avenue, Seattle, Washington.

Directors.—J. Axten, Havens Grant, and H. J. Power.

Vice-President and General Manager.—Harold J. Power.

Secretary.—Havens Grant.

Capital.—\$1,250,000.

Dividends.—Close corporation.

Trade Names.—Amrad Radio Products and Twin-R Electrical Specialities.

The Corporation operates the world's oldest broadcasting station erected in 1915, WGI. It designs and manufactures wireless telephone and telegraph apparatus, and fractional horse-power motors and specialities.

British Broadcasting Company, Ltd. (The)

Founded.—1922.

Head Office.—2, Savoy Hill, Victoria Embankment, W.C.2.

Directors.—Lord Gainford (Chairman), Godfrey Isaacs, John Gray, Henry M. Pease, Sir Wm. Noble, Major Basil Binyon, Archibald McKinsley, Sir Wm. Bull, Bart., M.P., W. H. Burnham.

Managing Director.—J. C. W. Reith.

Chief Engineer.—Capt. P. P. Eckersley.

Secretary.—Major G. V. Rice, M.A., A.C.A.

The shares may be allotted or disposed of as the Board may determine, provided that the Board shall not, without the previous written approval of the Postmaster-General allot more than 60,000 shares in the united capital to the following six companies or their nominees:—

Marconi's Wireless Telegraph Company, Ltd.

Metropolitan-Vickers Electrical Co., Ltd.

Radio-Communication Co., Ltd.

British Thomson-Houston Co., Ltd.

General Electric Co., Ltd.

Western Electric Co., Ltd.

and that the Board shall, up to a total of 39,994 shares, issue to applicants, being *bona fide* British manufacturers of wireless apparatus other than the above six companies, the full amount of shares (not exceeding 10,000 to any one applicant) for which applicants may apply.

Chinese National Wireless Telegraph Company (The)

Incorporated.—Under Special Charter by virtue of an agreement dated May 24th, 1919, between the Government of the Republic of China and Marconi's Wireless Telegraph Company, Ltd.

Office.—25, Ta Yang-i-pin Hutung, Peking.

Factory.—No. LL-738, Thorburn Road, Sha ghai.

Directors.—Lieut.-Gen. Ting Ching (Chairman), Rear-Admiral Chen Ngen Tao, Godfrey C. Isaacs, John P. Kenrick, A. H. Ginman (Vice-Chairman and Managing Director).

Secretary.—Sohstu G. King.

Capital.—Authorised £700,000 in 700,000 shares of £1 each.

The Company was formed to manufacture, sell and maintain wireless telegraph and telephone apparatus in China, and has been granted a licence by Marconi's Wireless Telegraph Company, Ltd., giving it the sole right to use in China all the Marconi Company's Patents, present and future, for wireless telegraphy and telephony.

Compagnie Générale de Télégraphie Sans Fil

Incorporated.—February 5th, 1918.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—H. Bousquet (President), Baron de la Chevrelère (Vice-President), E. Girardeau (Administrator), A. L. Atthalin, M. Bloch, A. Dupont, Godfrey C. Isaacs, E. May, N. Pietri, E. Sins, Paul Gauthier, L. Wibratte, Baron Jacques de Gunzburg.

Managing Director.—E. Girardeau.

Chief Engineer.—Major Brenot.

Capital.—62,500,000 francs, divided into 125,000 shares of 500 francs each, subscribed and fully paid; 32,000 Parts Bénéficiaires have also been issued.

The financial year ends December 31st.

Compania Marconi de Telegrafia Sin Hilos del Rio de La Plata

Incorporated.—August 4th, 1906.

Head Office.—Calle San Martin 459, Buenos Aires, Argentina.

Directors.—Captain Guillermo José Nunes (President), Señor Florence O'Driscoll (Managing Director), Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., Godfrey C. Isaacs, Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Señor Duncan Munro, Señor J. A. Pilling, Señor Carlos Pereira Pinto, Señor Enrique Schlieper, Sidney F. St. J. Steadman, Señor Antonio Terrarosa.

Secretary.—Enrique Schlieper.

Treasurer.—J. A. Pilling.

Auditor.—Herbert K. James.

Engineer.—E. Berry.

Capital.—\$2,000,000 gold, represented by 250,000 shares of \$5 gold each, series "AA," fully paid, and 150,000 Preference shares, 5 per cent. (non-cumulative) of \$5 gold each, series "BB," 35 per cent. has been called up on the "BB" shares. The balance is payable in instalments of 10 per cent. with not less than thirty days' notice. The financial year of the Company ends on May 31st.

Companhia Nacional de Communicações Sem Fio

Incorporated.—March 29th, 1922.

Head Office.—107, Rua 1º de Marco, Rio de Janeiro.

Directors.—Dr. Rodrigo Octavio Filho, Louis Edgar Sanceau.

President.—Dr. Rodrigo Octavio Filho.

Managing Director.—Louis Edgar Sanceau.

Capital.—Rs.600 000 \$000 divided into 6,000 shares of 100 \$000 each.

The objects of the Company are to exploit various patents of the Marconi Co., as also to act as agents for them.

Compañia Nacional de Telegrafia Sin Hilos

Incorporated.—December 24th, 1910.

Head Office.—Calle de Alcalá, 43, Madrid.

Branch Office.—Ronda de la Universidad 35, Barcelona; Buenos Aires 13, Bilbao.

Directors.—Excmo. Sr. General Don José de Bascaran; Excmo. Sr. Senatore G. Marconi, G.C.V.O., LL.D., D.Sc.; Godfrey C. Isaacs; Excmo. Sr. Don Antonio Comyn, Conde Vo. de Albiz; Excmo. Sr. Don Eduardo Estelat; Excmo. S. Don Francisco Setuain; Sr. Don Jaime Macnaughtan; Don A. Galvez Cañero; Don Carlos de Albert Despujol.

Secretary.—Sr. Don José Asensio.

Capital.—6,500,000 pesetas, divided into 8,000 6 per cent. Participating Preference shares of 500 pesetas each, and 5,000 Ordinary shares of 500 pesetas each, all issued and fully paid.

The financial year ends on December 31st.

This Company took over the concession from the Spanish Government for the construction and exploitation of a public wireless telegraph service in Spain and its colonies. The Company has ten wireless telegraph land stations erected and working at Aranjuez, near Madrid, Cadiz, Barcelona, Tenerife, Las Palmas, Vigo, Soller, Finisterre, Santander, and Cape Palos, and has further stations in course of construction. The Company holds an exclusive licence from Marconi's Wireless Telegraph Company, Limited, to use and exploit its patents in Spain and her colonies.

The Company has established a direct wireless telegraph service between Spain and England, via Madrid and London, with Germany via Madrid and Barcelona and Nauen, with Austria and Hungary via Barcelona and Budapest, with France via Madrid and Sainte Assise, with Italy via Barcelona and Rome, with Switzerland via Madrid and Berne, and with North, Central and South America via Madrid and London Marconi.

The Station at Barcelona works with England and Switzerland in order to handle rapidly the traffic of the Catalonian region. Moreover, very important improvements are being introduced at Madrid and Barcelona station with a view to still further increasing the efficiency of the International services. These alterations will, probably, have been completed at the time this book leaves the press.

Compagnie Radio-France

Head Office.—Paris, 79, Boulevard Haussmann.

General Offices and Showrooms.—166, Rue Montmartre, Paris.

Directors.—Jules Cambon (President), Henri Bousquet, Emile Girardeau, Nicolas Pietri, Louis Wilbratte, Marcel Bloch, Baron de la Chevrelère, André Dupont, Paul Gauthier, André Laurent, Athalin, Ernest May, Henri-Valentin Mehu.

Capital.—Frs. 60,000,000.

The Company which owns the great Radio Transmitting Centre of Ste. Assise and the Radio, Receiving Centre of Villecresnes, maintains public radiotelegraphic communication with Great Britain, America, Spain, Roumania, Czecho Slovakia, etc.

Compagnie Radio-Maritime

Incorporated.—April 24th, 1919.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—MM. Bousquet (President), Baron de la Chevrelère (Vice-President), N. Pietri, E. Girardeau, E. Sins, Dal Piaz, Musnier, and Max Robert.

Managing Director.—M. N. Pietri.

Capital.—7,000,000 francs, divided into 70,000 shares of 100 francs each.

The Company owns and operates wireless telegraph apparatus on merchant vessels.

The Company also operates aeroplane wireless stations.

Companhia Radiotelegraphica Brasileira

Incorporated.—August 14th, 1919.

Head Office.—107, Rua 1^o de Marco, Rio de Janeiro.

Directors.—Pedro A. Nolasco Pereira da Cunha, Louis Edgar Sanceau.

President.—Pedro A. Nolasco Pereira da Cunha.

Managing Director.—Louis Edgar Sanceau.

Members of the Fiscal Council.—Dr. Mario de Andrade Ramos, Señor Henrique Lage, Señor Joao Gentil de Mello Araujo.

Members of the Supplementary Council.—Jack Maurice, Dr. Rodrigo Octavio Filho, Señor Roberto Cardoso.

Capital.—Rs. 200,000 \$000 (two hundred contos de reis) divided into 2,000 (two thousand) shares of 100 \$000 (hundred milreis) each.

The objects of the Company are to exploit the contract made with the Government of Brazil for the erection of high power stations for direct communication with Europe and the United States.

Compania Radiografica Internacional de Costa Rica

Incorporated.—

Head Office.—San Jose.

Directors.—Mr. Jose J. Carranza Volio, Mr. Ricardo Pacheco Lara, Mr. Arturo Volio Jimenez, Dr. Antonio A. Facio Ulloa, Mr. Nicolas Peña Cañas.

President.—Mr. Jose J. Carranza Volio.

Vice-President.—Mr. Ricardo Pacheco Lara.

Treasurer and Secretary.—Mr. Nicolas Peña Cañas.

Auditors.—Mr. Porfirio Gongora Umaña, Mr. Juan Gomez Alvarez, Mr. Oscar Montealegre Gutierrez.

Manager.—Mr. Jose J. Carranza Volio.

Deputy Manager.—Mr. Ricardo Pacheco Lara.

Capital.—\$10,000 (gold American), 100 Shares.

The Company was formed solely and exclusively for the exploitation of the concession relating to wireless communications which is the property of Messrs. José Josquin Carranza Volio and Ricardo Pacheco Lara, according to the contract made with the supreme Government on May 5th, 1921, and approved by decree No. 47 of July 25th, 1921.

Federal Telegraph Company (The)

Incorporated.—In the State of California, in 1911.

Offices.—Hobart Building, San Francisco, California.

Factory.—Palo Alto, California.

Directors.—R. P. Schwerin, Leon Bocqueraz, Hiram W. Johnson, Jun., Alexander Hamilton and B. E. Alanson.

President.—R. P. Schwerin.

Vice-President.—Leon Bocqueraz.

Secretary.—Augustus Taylor.

Treasurer.—J. E. Godcharles.

Capital.—\$3,500,000⁰⁰; 350,000 shares, par value each \$10⁰⁰.

The Company was formed for the operation of wireless telegraphy and the manufacture of the Poulsen Arc and other wireless sets.

Independent Wireless Telegraph Company, Inc.

Incorporated.—February 12th, 1919, in the State of Delaware, U.S.A.

Head Office.—35, Water Street, New York, U.S.A.

Factory.—Port Chester, New York, U.S.A.

Directors.—P. R. Mallory, C. J. Pannill, C. D. Mallory, Frank C. Munson, Fulton Cutting.

President.—P. R. Mallory.

Vice-President and General Manager.—C. J. Pannill.

Treasurer.—R. M. Ganung.

Capital and Dividends.—Close Corporation.

The Company was formed for the operation of wireless telegraphy and the manufacture of wireless telegraph apparatus.

Marconi International Marine Communication Company, Limited (The)

Incorporated.—April 25th, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy Chairman and Managing Director), Lt.-Col. A. Simpson, C.M.G., R.E. (retired) (Deputy Managing Director), Alfonso Marconi, Capt. H. Riall Sankey, C.B., C.B.E., R.E. (retired), Henry W. Allen, F.C.I.S., W. W. Bradfield, C.B.E., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., and The Rt. Hon. F. G. Kellaway, P.C.

General Manager.—W. W. Bradfield, C.B.E.

Assistant General Manager.—F. S. Hayburn.

Secretary.—A. Ogle, M.C., A.C.I.S.

Marine Superintendent.—Capt. C. V. Daly.

Contract Manager.—A. R. Harding.

Technical Manager.—Commander J. A. Slee, C.B.E., R.N.

Deputy Traffic Manager.—J. Lewis.

Capital.—£1,500,000 in shares of £1 each, issued and fully paid £1,192,726. (The capital was increased in May, 1919, by 900,000 shares of £1 each, of which 600,000 were offered to existing shareholders pro rata at par.). 5½ per cent. First Mortgage debentures (bearer)—authorised £250,000 issued £125,000 outstanding, £58,020. Secured (without trust deed) as a floating charge on the undertaking and all the property. Redeemable at par, July 1st, 1941. Interest payable, January 1st and July 1st.

Accounts and Dividends.—Accounts are made up to December 31st and usually submitted in June following. The accounts at December 31st, 1922, showed, after payment of £6,500 on account of Corporation Profits Tax; a profit of £190,671, which included the amount brought forward. After payment of dividend £11,580, subject to Excess Profits Duty for years 1916 to 1920, less amounts paid on account, was carried forward.

Dividends paid, 1910, 5 per cent.; 1911, 7 per cent.; 1912, 1913 and 1914, 10 per cent.; 1915, 12½ per cent.; 1916, 1917, 1918, 1919 and 1920, 15 per cent.; 1921, 10 per cent.; 1922, 12½ per cent.; 1923, 5 per cent. interim.

Last Bearer Coupon paid, No. 24.

This Company was formed for the purpose of working throughout the world, except in the United States of America, Hawaii, Chili, and colonies or dependencies of those States, an exclusive licence for all maritime (being mercantile or yachting) purposes granted by Marconi's Wireless Telegraph Company, Limited. The Company has transferred to Associated Companies its rights in Canada, Argentina, Uruguay, Australasia, and all European countries and their dependencies except the United Kingdom and Italy. This Company owns and operates the wireless telegraph apparatus on about 3,000 vessels of the mercantile marine.

Marconi Scientific Instrument Company, Limited (The)

Incorporated.—November 1st, 1919.

Registered Office and Works.—21/25, St. Anne's Court, Soho, and 70 Dudden Hill Lane, N.W.10.

Directors.—William W. Drury (Managing Director), Henry W. Allen, Lt. Col. Adrian F. H. S. Simpson, C.M.G. Andrew Gray.

Secretary.—Arthur J. Wheeler, A.C.I.S.

Capital.—Authorised £40,000 in 40,000 shares of £1 each.

The Company was formed to manufacture and sell amateur wireless telegraphic and telephonic apparatus under licence from Marconi's Wireless Telegraph Company, Limited. Also to manufacture and market all classes of land-line and submarine cable apparatus.

Marconi Wireless Telegraph Company of Canada, Limited (The)

Head Office.—Marconi Building, 9-11-13, Saint Sacrament Street, Montreal, Canada.

President.—C. G. Greenshields, K.C.

Vice-Presidents.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Robert Bickerdike, A. F. Dymont

Directors.—Godfrey C. Isaacs, G. M. Bosworth, H. W. Allen, F.C.I.S., Dr. Milton, L. Hersey.

General Manager.—H. M. Short.

Secretary.—John D. Lowrey.

Traffic Manager.—G. H. Pearson, Assoc.I.R.E. (New York).

Chief Engineer.—J. H. Thompson, B.Sc., A.M.I.R.E. (New York), A.M.I.E.E. (New York) A.M.I.C.E. (Canada).

Authorised Capital.—\$7,500,000 in 3,000,000 shares of \$2.50 each.

Issued Capital.—\$6,000,000.

The Company has sole wireless rights under all Marconi and General Electric Company patents in the Dominions of Canada and Newfoundland. It is the only Company in Canada manufacturing wireless apparatus and providing wireless service. It owns and operates the wireless equipment on over two hundred ships of the Canadian and Newfoundland Mercantile Marines, and also owns and operates the duplex, transatlantic, commercial wireless telegraph station at Glace Bay in Nova Scotia.

The Company operates under contract with the Canadian and Newfoundland Governments, about forty wireless stations in the Great Lakes, Gulf of St. Lawrence, and on the Atlantic Coast. It has branch offices in Vancouver, B.C., Toronto, Ont., St. John, N.B. (winter), and St. John's (Nfld.). It owns and operates schools of radiotelegraphy in Montreal, Toronto, and St. John's (Nfld.).

Marconi's Wireless Telegraph Company, Limited.

Incorporated.—July 20th, 1897, as "Wireless Telegraph and Signal Co., Ltd.,"; name changed as above in March, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Works.—Chelmsford, Essex.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy-Chairman and Managing Director), Lt.-Col. Adrian Simpson, C.M.G., R.E. (retired) (Deputy Managing Director), Captain H. Riall Sankey, C.B., C.B.E., R.E. (retired), Alfonso Marconi, Henry W. Allen, F.C.I.S., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., and The Rt. Hon. F. G. Kellaway, P.C.

Joint General Managers.—H. W. Allen, F.C.I.S., Andrew Gray, A.G.T.C., M.I.E.E., A.M.I.C.E.

Assistant General Managers.—G. E. Turnbull, H. W. Corby, F.C.I.S., and C. E. Rickard, O.B.E., M.I.E.E., M.I.M.E.

Secretary.—A. Ogle, M.C., A.C.I.S.

Engineer-in-Chief.—R. N. Vyvyan, M.I.E.E.

The Company was formed to acquire Senatore Marconi's patents for wireless telegraphy in all countries except Italy, its colonies and dependencies, and has since acquired a large number of other patents relating to wireless telegraphy, including those of Sir Oliver Lodge, the General Electric Company of New York (except for America), etc.

It has substantial interests in various subsidiary and affiliated Companies.

The Company conducts public wireless telegraph services, and messages are accepted for transmission, via Marconi, to the United States of America, Central and South America, Canada, Australia New Zealand, the West Indies, British Guiana, British Honduras, Spain, France, Switzerland, Austria, etc.

Accounts and Dividends.—Accounts are made up to December 31st. The Company's accounts at December 31st, 1922, showed shares in Associated Companies and Patents, £3,543,531, and General Reserve Account £3,980,355. The profit for the year, together with the balance brought forward, was £967,778, and after payment of dividends, £525,272 was carried forward.

In respect of each of the years 1911, 1912 and 1913, the Company paid dividends of 17 per cent. on the Preference shares and 20 per cent. on the Ordinary shares; in respect of 1914 and 1915, 7 per cent. Preference and 10 per cent. Ordinary dividends were paid; in respect of 1916 the dividends were 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares; in respect of 1917 the dividends were 17 per cent. on Preference shares and 20 per cent. on the Ordinary shares. For 1918 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid. For 1919 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid, plus a bonus of 5s. per share on both Preference and Ordinary shares. For 1920, 1921 and 1922, dividends of 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares were paid. (Last Bearer Coupons paid: No. 25 Preference, No. 24 Ordinary.)

Capital.—Authorised £4,000,000 in 3,750,000 Ordinary shares of £1 each, and 250,000 Cumulative Participating Preference shares of £1 each. Issued 2,750,065 Ordinary shares of £1 each, and 250,000 Preference shares of £1 each. The Preference shares are entitled to a cumulative dividend of 7 per cent., and, after the Ordinary shares have received a 10 per cent. non-cumulative dividend, to share *pari passu* with the latter shares in surplus profits remaining.

6½ per cent. Ten-Year Convertible First Debenture Stock. Authorised, £3,000,000. Issued, £1,500,000. Outstanding, £1,499,800. Secured as a first floating charge on all the Company's assets present and future, including uncalled capital (if any). Repayable on or before October 1st, 1932.

Stockholders have right to convert on any January 1st, April 1st, July 1st and October 1st, between April 1st, 1923, and April 1st, 1929, all or any part of their holding into ordinary shares on the basis of one fully paid share of £1 for each £3 of debenture stock.

Interest payable half-yearly on April 1st and October 1st.

Nederlandsche Seinoestellen Fabriek

Incorporated.—February 27th, 1918.

Head Office and Works.—Jan v. d. Heydenstraat, Hilversum, Holland.

Directors.—Bern E. Ruys (President), G. L. Tregelberg (Commissaire Délégué), D. Hudig, L. Jzn, A. J. M. Goudriaan, J. H. Hummel, A. E. J. Bertling, A. Veder, G. C. Isaacs, G. E. Turnbull, J. Rypperda Wierdsma, J. F. van Hengel, P. J. Roosegaarde Bisschop, G. Perier, M. H. de Beaufort, G. Marconi, M. Travailleux, A. Philips.

Manager.—A. Dubois.

Capital.—3,000,000 florins, divided into 3,000 shares of 1,000 florins each.

The financial year ends, December 31st.

The Company was formed for the purpose of exploiting a factory or factories for the manufacture of installations, apparatus and tools destined for or relating to wireless telegraphy, telephony, signalling apparatus, etc., and trading in the above-mentioned apparatus. It has entered into an agreement with Marconi's Wireless Telegraph Company, Limited, whereby the latter Company grants to the N.S.F. the exclusive right to manufacture and sell in Holland and the Dutch Colonies wireless material according to its Patents and designs, present and future.

Representatives for Holland and Colonies.—For the New Antwerp Telephone and Electrical Works at Antwerp and The Dubilier Condenser Co., Ltd.

Nederlandsche Telegraaf Maatschappij, "Radio-Holland"

Incorporated.—December 6th, 1916.

Head Office.—562 Keizersgracht, Amsterdam.

Directors.—D. Hudig L. Jzn (President), J. Rypperda Wierdsma, A. J. M. Goudriaan, M. H. de Beaufort, G. L. Tregelberg, P. J. Roosegaarde Bisschop, Prof. C. L. van der Bilt, J. F. van Hengel, Bern E. Ruys, J. H. Hummel, A. F. Philips, A. E. J. Bertling, A. Voder, Senatore G. Marconi, Godfrey C. Isaacs, Maurice Travailleux, Gaston Périer, G. E. Turnbull.

Managing Directors.—L. H. F. Wackers and Th. P. van den Bergh.

Administrator, Dutch East Indies.—W. A. J. Liebert.

Capital.—3,000,000 florins, divided into 3,000 shares of 1,000 florins each, of which 2,000 shares have been issued and fully paid.

The financial year ends at December 31st.

The Company was formed for the purpose of the establishment, sale, hire, control and exploitation of wireless telegraph and wireless telephone stations in Holland and its colonies.

Norsk Marconikompani Aktieselskap

Constituted.—November 28th, 1918.

Head Offices.—Drammensveien 42, Kristiania.

Branch Office.—Fimmegaardsgaten 6, Bergen.

Capital.—1,250,000 Kroner, divided into 1,250 registered shares of Kroner 1,000 each.

Directors.—Otto Thoresen (Kristiania), Godfrey C. Isaacs (London), Commander J. Bull (Horten) K. Zimmer (Bergen), Louritz Kloster (Kristiania) G. E. Turnbull (London).

Deputy Directors.—A. Hubert (Bruxelles). J. Ringstad (Drammen).

Managing Director.—E. S. Skottun.

Technical Manager.—B. L. Gottwaldt.

This Company was constituted for the manufacture, sale, and rental of apparatus for Wireless Telegraphy, Telephony, Signalling, etc., and other business in connection therewith. It has acquired the Marconi patent rights, present and future, for exploitation in Norway and on board ships flying the Norwegian flag.

Radio Austria, Limited,

Date of Incorporation.—13th July, 1923.

Directors.—Baron Carl Pitner (Chairman), H. A. White (Managing Director), Capt. Francis Leist (Manager), Hans von Mauthner, M. Straffner, Consul-General Richard Fanta, Ministerial Councillor Haider, Fritz von Kammann, Lt.-Colonel Adrian Simpson, C.M.G.

Manager.—Capt. Francis Leist.

Capital.—£133,000 divided into 133,000 bearer shares of £1 each.

Head Office.—Renngasse 14, Vienna 1.

Objects.—The establishment and working in Austria of stations for wireless telegraphy and wireless telephony in accordance with the official authorisations granted to it for the purpose.

Radio Communication Company, Limited

Incorporated.—March 14th, 1919.

Head Office.—34/35, Norfolk Street, London, W.C.2.

Directors.—Sir Wm. R. Brooke, K.C.I.E., J. Herbert Scrutton, Capt. R. S. Hilton, Axel W. Berg, B. Binyon, O.B.E. (Managing Director).

General Manager.—E. A. B. Snoden.

Secretary.—W. H. C. Rowe, C.B.E.

Capital.—£200,000, divided into 100,000 6 per cent. Cumulative Participating Preference shares and 100,000 Ordinary shares. Issued: 79,502 Ordinary and 86,650 Preference.

The Company was formed under the aegis of the Indo-European Telegraph Company, Limited, for the manufacture, sale and operation of radio apparatus, including "Polar" radio equipment for ships.

Radio Corporation of America

Incorporated.—October 17th, 1919, in the State of Delaware.

New York Office.—Woolworth Building, 233, Broadway, New York City.

Directors.—Owen D. Young (Chairman), E. J. Nally, E. W. Rice, Jun., Hon. John W. Griggs (General Counsel), James R. Sheffield, A. G. Davis, Gordon Abbott, Edward W. Harden, George S. Davis, Guy E. Tripp, Edwin M. Herr, Arthur E. Braun, James G. Harbord, John Hays Hammond, Jun., Harry P. Davis.

President.—Major General James G. Harbord.

Managing Director of International Relations.—Edward J. Nally.

Vice-President and General Manager.—David Sarnoff.

Vice-President and General Attorney.—William Brown.

Secretary.—John W. Elwood.

Assistant Secretary.—L. MacConnach.

Comptroller.—Charles J. Ross.

Treasurer.—George S. de Sousa.

Assistant Treasurer.—M. H. Payne.

Capital.—Authorized: \$25,000,000 Preferred Stock in 5,000,000 shares of \$5 each. There are also 7,500,000 Common shares of no par value. Issued: \$19,779,870 in 3,955,974 Preferred shares of \$5 each, fully paid 5,732,000 Common shares of no par value. Rights: The Preferred Stock is entitled to receive dividends of 7 per cent. per annum and no more. In any distribution of the assets it is entitled to be paid off at par, prior to any payment to the Common shareholders. The Preferred dividends are cumulative after the fiscal year ending in or with the calendar year 1923, and the Preferred Stock may be retired on any day on which a dividend thereon shall be payable at \$5.50 per share and accrued dividends.

The Company was formed to acquire certain assets of The Marconi Wireless Telegraph Company of America and all wireless inventions, present and future, of the General Electric Company of New York.

Radioromana Societate Anonima Romana pentru Industria si Comertul de Materiale Telegrafice, Telefonice si Electrice.

Incorporated.—April 5th, 1920, under the name "Marconi S.A.R.," amalgamated with "Radio electrica," with effect from October 27th, 1921.

Address of Head Office.—Rue Smardan 13, Bucarest, Roumania.

Directors.—Mr. C. P. Olanescu (President), Prince Barbu Stirbey (Vice-President), Godfrey Isaacs, N. Vasilescu-Karpen, N. Tigara-Samurcas, E. Boxshall, C. D. Busila, J. Sabattier, D. Leonida, E. Girardeau, G. Tenot, I. Coroiu.

Managing Directors.—D. Leonida, G. Tenot, E. Boxshall.

Secretary General.—Major A. A. O'Kelly.

Capital.—Lei 12,000,000. 24,000 fully paid-up shares of 500 lei each.

The company was formed for the manufacture, supply and installation of all kinds of telegraphic and telephonic apparatus, including wireless.

Radio Station Marconi Societe Anonyme, Berne.

Incorporated.—February, 1922.

Head Office.—Hotel Principal des Postes, Berne, Switzerland.

Directors.—Dr. F. Truessel (President), Dr. Usteri (Vice-President), Henry W. Allen, Dr. Furter (Director-General of Swiss Telegraphs), M. Chapuisat, M. Schmidlin, Herbert A. White.

Manager.—Dr. F. Rothen.

Capital.—1,800,000 francs, divided into 3,600 shares of 500 francs each.

The Company has been granted a concession by the Swiss Government for the erection of a station at Berne and it conducts commercial wireless telegraph services with England, Spain and other European countries.

Financial Year.—Ends December 31st.

R.M. Radio Limited

Registered.—September 6th, 1919.

Head Office and Engineers' Offices and Show-rooms.—21, Garrick Street, Leicester Square, W.C.2

Directors.—H. R. Rivers-Moore, L. J. Graham, A. G. Ionides, C. N. Rivers-Moore.

Secretary.—R. C. W. Clarke.

Capital.—£20,000.

The Company was formed for the purpose of constructing, supplying, maintaining and operating radiotelegraphic and telephonic apparatus of all kinds for the purpose of intercommunication on and, at sea, and in the air.

Russian Company of Wireless Telegraphs and Telephones (The)

Incorporated.—October 8th, 1908.

Head Office.—14, Lopouchinskaja, Petrograd, Russia.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., G. C. Isaacs, S. M. Eisenstein, Pierre de Balinski, M. Salberg, Lt.-Col. Adrian Simpson, C.M.G., R.E., (Managing Director), Admiral I. F. Bostrem, I.R.N. (retired), L. M. Eisenstein (Deputy Director).

Secretary.—Leon Eisenstein.

Capital.—Originally 1,200,000 roubles in 12,000 shares of 100 roubles each. This capital was increased to 1,800,000 roubles in November, 1911, in order to enable the Company to acquire a licence from Marconi's Wireless Telegraph Company, Limited. The capital was further increased in 1913 to 2,400,000 roubles, and in 1914 to 3,000,000 roubles, divided into 30,000 shares of 100 roubles each.

The financial year ends December 31st (Russian date).

Dividends.—In respect of the years 1912 and 1913 dividends of 6 per cent. have been paid and 15 per cent. in respect of 1914 and 1915, and 17 per cent. for 1916.

The Company owns the Russian patents taken out in the name of S. M. Eisenstein, and also holds an exclusive licence to use and exploit the Marconi Company's patents in Russia (excluding stations for international communication or on vessels of Russian Mercantile Marine).

The works belonging to the Company were nationalised by decree of the Bolshevik Government in 1918, and since that time have been under Soviet control.

Siemens Brothers & Co., Ltd.

Incorporated.—December 28th, 1880.

Head Office.—Caxton House, Westminster, London, S.W.1.

Directors.—G. Mure Ritchie, (Chairman), Rt. Hon. Sir William Bull, Bart., M.P., General Sir Hubert de la Poer Gough, G.C.M.G., K.C.B., K.C.V.O., Right Hon. Lord Queenborough, Sir Walter Roper Lawrence, Bart., G.C.I.E., G.C.V.O., C.B., William Oliver Smith, Henry John Thomas, George Chauvin.

Managing Director.—George Chauvin.

Secretary.—Walter Wheeler, F.C.I.S.

General Manager.—Francis Hird, M.I.E.E.

Capital.—Authorised £2,500,000 in 1,500,000 ordinary shares of £1 each and 1,000,000 10 per cent. Cumulative Preference Shares of £1 each. Issued and fully paid 1,500,000 ordinary shares and 300,000 Preference Shares. $\frac{1}{2}$ per cent. Debenture Stock issued £1,000,000. Outstanding £904,100.

Manufacturers of, and dealers in, all classes of electrical cables. Telephone, telegraph, signalling and measuring apparatus. Wireless equipments, batteries, etc.

Societa Anonima Fiumana per le Radio Comunicazioni

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Prof. Arturo De Meichsner, Sig. Idone Rudan, Ing. Guido Lado; Ing. Carlo Conighi, Comm. Bernardo Micchiardi, Comm. Cesare Salvagnini.

Censeurs.—Avv. Ernesto Franchi, Sig. Giovanni Santini, Sig. Giulio Bresci, Sig. Annibale Ploech.

Capital.—L.150,000 (authorised L.1,500,000).

Société Anonyme Internationale de Télégraphie Sans Fil

Incorporated.—March 31st, 1913.

Head Office.—13, Rue Bréderode, Brussels.

Capital.—4,500,000 francs, divided into 9,000 shares of 500 francs each, all issued and fully paid.

The last dividend paid was 15 per cent. for the year 1922.

The financial year ends at December 31st.

The Company exploits wireless telegraphy on vessels of the mercantile marine of all European countries excepting the United Kingdom of Great Britain and Ireland, Germany, Austria-Hungary Italy and France, and at the present time owns and operates wireless telegraph apparatus on over 600 vessels.

Société Belge Radio-Electrique, Société Anonyme.

Incorporated.—October 4th, 1922.

Head Office.—4, Rue d'Egmont, Brussels.

Directors.—M. Félicien Cattier (Président), MM. Henri Baron Lambert de Formanoir de la Cazerie, Léon Baron de Steenhault de Waerbeek, Em. Girardeau, Baron Léon Greindl, Maurice Hulin, Godfrey Isaacs, Gaston Périer, Maurice Travaillleur, Henry Urban, Firmin Van Brée, Jacques Van Hoegaerden.

Managing Director.—Mr. Maurice Philippson.

Capital.—4,000,000 Francs, divided into 8,000 shares of 500 francs each.

Société Française Radio-Electrique, Société Anonyme.

Incorporated.—April 4th, 1910.

Head Office.—79, Boulevard Haussmann, Paris.

Laboratory and Works.—Levallois-Perret (Seine), 2, Quai Michelet.

Big Machine Works.—Belfort: Société Alsacienne de Constructions Mécaniques.

Tower and Pillar Works.—Venissieux (Rhône), 72, Chemin du Moulin à Parilly.

Chairman.—M. Henri Bousquet.

Vice-Chairman.—M. G. Ferrand.

Financial Directeur.—M. A. Fondère.

Managing Director.—M. E. Girardeau.

Directors.—Comte de Beaumont, Baron de La Chevrelière, P. Desachy, A. Dupont, N. Pietri, O. de Rivaud.

Technical Manager.—Major P. Brenot.

Technical Advisers.—MM. Bethenod, Latour, Boucherot, de Bellescize, Petit.

Capital.—12,000,000 francs, divided into 120,000 shares of 100 francs each, all issued and paid up.

The Company manufactures wireless telegraph apparatus and engines, and erects wireless stations, and also owns and operates the patents of MM. J. Bethenod, E. Girardeau, M. Latour, etc.

It exploits chiefly that system of wireless telegraphy which employs high-frequency machines, the system adopted for all the great stations of France and its Colonies and by various other Governments.

Société Indépendante Belge de Telegraphie Sans Fil, Société Anonyme

Incorporated.—January 29th, 1920.

Head Office.—4, Rue d'Egmont, Brussels.

Directors.—M. Henri Baron Lambert (President), MM. Van Hoegaerden le Baron de Steenhault Maurice Philippson, de Formanoir, Wormser, M. Van Halteren.

Manager.—Major Roland.

Capital.—1,000,000 francs, divided into 2,000 shares of 500 francs each.

Société Indépendante de Télégraphie sans Fil

Head Office.—66, Rue la Boétie, Paris.

Works and Laboratory.—Malakoff 76 Route de Châtillon.

Administrators.—M. M. Boé (Président), F. Bézerie, Maurice E. Wormser.

Manager.—Mr. Lezaud.

Director délégué.—E. Wormser.

Technical Advisers.—M. le Docteur L. Brillouin, Laüt, Poncet.

Capital.—1,500,000 francs, divided into 3,000 shares of 500 francs each, issued and fully paid.

The Company manufactures wireless telegraph and telephonic apparatus, including valves, and constructs and maintains wireless stations, both land and ship. The Company operates the patents of G. Beauvais, R. Braillard, L. Brillouin, R. B. Goldschmidt, P. J. Laüt, etc.

Societe Radiotechnique Polonaise (P.T.R.) Société Anonyme

Incorporated.—January 3rd, 1920.

Head Office.—22, Rue Wilcza, Warsaw.

Works.—"Radio Works," 9, Rue Zajaczkowska, "Mechanical Works," 3, Rue Syrena, Warsaw.

Directors.—Henryk Korwin Krukowski (Chairman), Henryk Schanipanier, Henryk Kolberg, Godfrey C. Isaacs, Emile Girardau, Eugène Hannotiaux, Raymond Hubbard, Casimir Kowalewski, Roman Rudniewski, Wladyslaw Heller, Felician Karsnicki, Comte Henryk Potocki.

General Manager.—Henryk Kolberg.

Managers.—Felician Karsnicki (Joint General Manager), Wladyslaw Heller (Director of Radio Works), Leon Malecki (Director of Mechanical Works), Roman Rudniewski (Commercial Director), Alexis M. Cheftel (Technical Director).

The Company manufactures wireless telegraph and telephone apparatus and exploits the patents and licences relating thereto.

Svenska Radioaktiebolaget.

Incorporated.—July 29th, 1921.

Head Office.—Alstromergatan 12, Stockholm, Sweden.

Directors.—Mr. Axel Lindblad, Mr. Gustaf Dalen, Mr. Oscar Falkman, Mr. Ivar Wibom, Mr. Gottlieb Piltz, Mr. Ulrich Salchow, Mr. Godfrey C. Isaacs, Lieut. Col. Adrian Simpson, Mr. G. E. Turnbull.

Manager.—Captain I. Wibom.

Capital.—Kr. 700,000 divided into 7,000 shares of Kr. 100 each.

Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H.

Incorporated.—June 15th, 1903.

Head Office.—Hallesches Ufer 12/13, Berlin, S.W.11.

Directors.—Dr. Ing. e.h. Count von Arco, Dr. Ing. C. Schapira, Fritz Ulfers, Hans Bielschowsky.

Founded by the Allgemeine Elektrizitäts-Gesellschaft, Berlin, and Siemens and Halske A.G., Berlin, for the exploitation of the patents of Professor Slaby, Professor Braun, and Count von Arco, all over the world.

The Company whose shares are in the sole possession of the Allgemeine Elektrizitäts-Gesellschaft and Siemens and Halske, Berlin, is interested in the following companies:—

Det Norske Radioselskap (System Telefunken), Kristiania.

Deutsche Betriebsgesellschaft für drahtlose Telegrafie m.b.H., Berlin (Debeg).

Deutsche Südsee-Gesellschaft für drahtlose Telegrafie A.-G., Berlin.

Drahtloser Europa-Wirtschafts-Rundfunkdienst (Europradio), Berlin.

Drahtloser Uebersee-Verkehr, A.-G., Berlin (Transradio).

Eilvese G.m.b.H., Berlin.

Kresla spol. elektrotechnická kommanditurné společnost, Praha-Karlín, Palackého Str. 28.

Oesterreichische Drahtlose Verkehrs-Gesellschaft m.b.H., Wien.

Rundfunk, G.m.b.H., Berlin.

Société Anonyme Internationale de Télégraphie sans Fil, Brussels.

Società Radiotelegrafica Italiana, Rom.

Svenska Aktieförbundet Drahtloses Telegraf, Stockholm.

Telefunken-Marconi Code A.-G., München.

Telefunken, Ostasiatische Gesellschaft für drahtlose Telegraphie m.b.H., Shanghai.

Transradio Compañía Radiotelegráfica Argentina S.A., Buenos Aires.

Transradio A.G. für Drahtloser Uebersee-Verkehr

Founded.—1918.

Head Office.—Berlin S.W.11, Hallesches Ufer 12/13.

Founded by the Allgemeine Elektrizitäts-Gesellschaft, Siemens & Halske A.-G. and Telefunken Gesellschaft für drahtlose Telegraphie m.b.H. Berlin. The Company was formed to exploit installations for wireless telegraphy and telephony in Germany and other countries.

Board of Directors.—Dr. Ing. P. Mamroth, Dr. Franke, Dr. Georg Graf v. Arco, E. Heinemann, Geh. Oberfinanzrat W. Müller, Dr. C. Schapira.

Managing Directors.—F. Ulfers, E. Rotschmidt, H. Bielschowsky, E. Quäck.

The Company which operates the high power stations of Nauen and Eilvese (Hanover) maintains a direct wireless telegraph service with North- and South-America, Egypt, Russia, Italy, Spain, etc.

Transradio Internacional Compañía Radiotelegráfica Argentina

Founded.—December 14th, 1920.

Head Office.—Bernado de Irigoyen 330, Buenos Aires.

Directors.—Eduardo Huergo (President), Messrs. E. Albert, Hayes, Lloyd-Hillst, Meyer, C. M. Pelegriani, Page, S. Pineemin, Roberts and R. J. Schmidt.

Managing Director.—R. J. Schmidt.

Capital.—Authorised; 14,000,000 pesos; issued 11,000,000 pesos.

The Company was formed to erect wireless stations and to exploit wireless services. It is already operating a high-power station in Buenos Aires.

Tropical Radio Telegraph Company

Incorporated.—June 2nd, 1913, Delaware.

Head Office.—131, State Street, Boston, Mass.

Directors.—John S. Bartlett, Victor M. Cutter, Crawford H. Ellis, W. Cameron Forbes, Reginald Foster, Francis R. Hart, Robert F. Herrick, George C. Lee, William Newsome, Bradley W. Palmer, Andrew W. Preston, William S. Spaulding, Daniel G. Wing.

President.—Andrew W. Preston.

General Manager.—George S. Davis.

Secretary.—Arthur E. Nicholson.

Assistant Secretary.—Philip K. Reynolds.

Assistant Secretary.—John L. Warren.

Treasurer.—Cecil B. Taylor.

Assistant Treasurer.—Arthur E. Nicholson.

Chief Engineer.—William E. Beakes.

The fiscal year ends December 31st of each year.

The Company operates a system of radio communication between the United States and the various countries of Central America.

Wireless Specialty Apparatus Company

Incorporated.—June 14th, 1907, New York, N.Y.

Head Office.—131, State Street, Boston, Mass.

Directors.—George S. Davis, William Newsome, Victor M. Cutter, C. B. Davis, John W. Elwood, T. S. Knight, J. A. Dalzell.

President.—George S. Davis.

Vice-President.—William Newsome.

Secretary.—John L. Warren.

Treasurer.—E. C. Porter.

General Manager.—Walter J. Henry.

Chief Engineer.—John A. Proctor.

Consulting Engineer.—Professor Greenleaf Whittier Pickard.

Capital.—\$492,000.

The fiscal year ends December 31st of each year.

The Company is engaged in the development and manufacture of radio apparatus and devices and of "Faradon" condensers for both high and low tension work, including condensers of special design for continuous wave radio apparatus.

COMMERCIAL AIRCRAFT WIRELESS PROGRESS IN 1923.

By DUNCAN SINCLAIR.

IN the Aviation Section of the previous edition of this YEAR BOOK the section "Signalling on our Airways" outlined the ground organisation of the British routes, and demonstrated the vital part played by wireless. In the intervening twelve months, no inconsiderable amount of progress has been made, and it will be of distinct interest to study the general trend of events, and to consider how far wireless has gone towards assisting aviation to take its place as one of the world's foremost means of transport and communication.

The close of 1922 saw the British Air Companies operating from London to Paris, Brussels, Amsterdam and Cologne with regular services, and with the immediate prospect of extensions, on the one hand within the British Isles to Manchester, and on the other to other European towns. With the advent of the Spring these projects materialised and Messrs. Daimler's commenced an extension of their London-Amsterdam service to Bremen, Hamburg and Berlin. In its initial stages this route was operated only once a week, and, in return for the facilities afforded by the German Government, permission was granted for German aircraft to operate over the same route also once weekly. As far as the British Company was concerned the service became so successful that in a very short time three regular return trips were taking place from London to the German capital between the Monday and Saturday. The Manchester route also opened.

Practically simultaneously Messrs. Handley Page began flying from Paris to Zurich, as an extension of their London-Paris service, and Messrs. Instone's London-Brussels service extension to Cologne became definitely established.

Towards the Summer the British Marine Air Navigation Company commenced an experimental service between Southampton and the Channel Islands, a service of more than usual interest to the aviation world as it was the first flying boat service to be brought into operation.

All this meant an increase of work for the ground wireless organisation, and, in the light of previous experience, steps were accordingly taken to give every possible assistance from the point of view of wireless navigational aids. How far the routine in this connection has been altered will be observed by a consideration of the Regulations and Procedure hereafter.

By far the most difficult route of this service was that from London to Berlin, mainly from the points of view of distance and lack of general facilities. The service as far as Holland was, of course, perfectly normal in every respect, but once into Germany the work became practically pioneer in nature owing to aerodromes being but sparsely equipped and being without wireless stations. After several weeks of running, the service was consequently changed from its original route to that *via* Hanover, which became the only stopping place between Amsterdam and Berlin. And then the Company settled down to establish regularity and reliability, and endeavours were made to obtain the usual airway organisation. With what degree of success this work was rewarded may be gathered from the fact that a practically continuous return service now runs three times every week, and that over a route sometimes richly abundant in fog and every conceivable form of bad weather. When one considers that to travel to Berlin by train and boat

takes just 24 hours, that to go by air takes 5½ hours, and that the difference between the first class ground fare and the air fare is practically negligible, one cannot but feel that results have been forthcoming.

To be in Trafalgar Square at eight o'clock in the morning, and in Unter den Linden at three o'clock that afternoon, is no longer a myth but an established fact. Nor is it any more of a myth to be able to know that the London air express has left Zurich, Berlin, or any other point on the air route within a few minutes of its departure; or even to know just where it is, and to communicate with the aircraft itself at any time desired when within the British control area.

The wireless organisation on the Berlin route is of particular interest, for route wireless stations exist in five countries along it. Those with which it is chiefly concerned, however, lie in Holland and Germany. As far as Rotterdam full wireless facilities exist, with the exception of a direction finding service in Holland, which it is hoped will be introduced at no very distant date. Route traffic and meteorological messages are available, Rotterdam acting as the linking station between Hanover and Berlin on the one side and London on the other. For the present no radio telephony stations are in operation in Germany for purely aircraft purposes, nor are there any purely aircraft direction finding stations. When matters settle down, however, there is no doubt that such stations will be forthcoming, the more especially as the Deutscher Aero Lloyd A.G. is to run a service between Berlin and Moscow *via* Königsberg, and also from Berlin to other centres.

The end of 1923 saw the signing of the agreement bringing into being the new big British air combine under the title of the "Imperial Air Transport Company, Ltd." which is designed to absorb the four previously mentioned companies. In the agreement the new company undertakes to operate those airways at present being worked by the four companies, or to provide equivalent air transport. In return a Government subsidy of £1,000,000, spread over a period of ten years with effect from April 1st, 1924, is guaranteed. This agreement is not without a considerable meaning as far as the aircraft wireless industry is concerned. In one aspect it is equivalent to giving a ten years' security of tenure to civil aviation, which also signifies ten years during which there is bound to be a constant and increasing demand for wireless. Again, apart from this aspect, it is fast becoming recognised by everybody concerned with the pilotage and navigation of commercial aircraft that wireless in any of its forms is going to be one of the first considerations for ensuring the safety of life and the regularity of the services.

At this juncture it will be of interest to remark upon some recent instances of wireless navigation.

On November 21st, 1923, an aircraft belonging to the Instone Air Line left the Croydon Aerodrome, bound for Cologne, at half-past ten in the morning. The weather conditions over the route at this hour were as follows:—

Croydon	visibility 1,000 yards, clouds 450 feet.
Biggin Hill ..	visibility 500 yards, clouds 450 feet.
Lympne	visibility 300 yards, clouds 150 feet.

Before leaving the aerodrome the pilot of this aircraft informed the wireless station that he intended to rely entirely on direction finding to take him through. Four D.F. positions were passed to the machine between 10.40 a.m. and 11.33 a.m., during which period the machine was flying at 3,500 feet and the pilot could see nothing of the ground at all. At 11.33 a.m. the pilot told Croydon by telephony that he would go down and endeavour to see where he was, and in a few minutes he reported that he was three miles to the west of Dunkirk, which position was exactly that which had been given him by Croydon and Pulham a few moments previously.

On the 31st October, 1923, the same pilot was returning from Cologne in D.H.34 GEBBT in bad weather. He established communication with Croydon and asked for a position which was given him as two miles S.W. of Thiel. Relying on this position he set a course for Ostend and came out over the latter place without further assistance, although the visibility remained extremely bad. The distance from Croydon to Thiel is approximately 140 miles.

On the 12th November, 1923, he carried out a D.F. exercise with Croydon when conducting an engine test flight in Vickers Vimy GEASI in the vicinity of the aerodrome. At 10.48 he called for a position which was given to him by the D.F. stations as 24 miles S.W. of Croydon. He then asked for a series of true bearings from Croydon on which he might set his course to return to the aerodrome. Three bearings were given him by the Croydon station between 10.48 and 11 o'clock, and at a few minutes past 11 the machine was seen over the S.W. corner of the aerodrome and the pilot informed accordingly. The pilot, on landing, stated that he had entirely neglected to study ground landmarks during this flight, and had, as a test, navigated his machine entirely on the bearings given by the Croydon station.

These three incidents show good examples of the three main objects of D.F. on civil air routes:—

- I. To enable pilots to get through when weather conditions are bad over the whole route.
- II. To enable pilots to get through bad weather conditions at one particular point on a route.
- III. To guide pilots over the aerodrome of destination in thick weather. And they also serve to show both the splendid spirit of the aircraft personnel and the degree of perfection to which the direction finding service can be maintained.

The value of the experience obtained during the summer 1922 and 1923, both by the ground and air staffs and which was hopefully referred to in last year's aircraft section, has now become apparent. Though there will doubtless be occasions when such a degree of accuracy is not always possible, yet the availability of such a service is everything and places air transport, from the point of view of safety, on a footing as nearly equal as possible to railway and ocean travel.

Another interesting event in 1923 was the initiation of an airship scheme, for communication with Egypt and India, named after its promoter, Commander Burney. Though this scheme has yet some eighteen months or two years perhaps to go before the first experiments can probably take place, yet there is every indication of a British airship service being run at no very distant future date. Here once more there will be a fertile field for the aircraft wireless industry.

The route, which will probably be from Pulham to Calcutta via Malta, Cairo and Karachi, is one along which a large number of wireless stations of every kind exist, though atmospheric conditions varying throughout the twenty-four hours may be likely to hinder signalling somewhat in the experimental stages. But difficulties will doubtless be overcome.

Hitherto in aircraft communication it has been the practice to use radiotelephony on the grounds of rapidity and simplicity of operation for the particular classes of messages to be passed. It has also been the practice to call upon the pilot of the aircraft to operate the wireless set owing to the general lack of space and accommodation which would be necessary to carry a special wireless operator. It must be agreed, however, that there is a certain amount of liability to inaccuracy in the use of radiotelephony which may even be said to outweigh any benefits to be obtained from the point of view

of speed in manipulation. With effect from January 1st, 1926, by which time it is anticipated that much greater skill in all branches of civil flying will have been obtained and sufficient experience will have been forthcoming, the uses of radiotelephony for ground to air communication will be decreased. Its place will be taken by radiotelegraphy on the bigger aircraft; though for small machines it will probably continue in use for some time. When this time comes it will be necessary to carry a wireless operator who will be specially examined and certificated for aircraft operator's duties, and will in all respects be working on a basis exactly similar to that of the present mercantile marine operator. From which it will be gathered that commercial aviation is slowly but surely coming into line with its sister industries.

The Air Navigation Directions of 1922 lay down that aircraft carrying ten or more passengers and travelling a hundred miles or more, or passing over twenty miles of sea at any part of their journey shall be required to carry wireless apparatus. This means that in January, 1926, and subsequently, practically all commercial aircraft will be equipped with wireless telegraphy sets, and in order for these sets to be efficiently manipulated a special wireless operator will have to be added to the crew. Article 14 of the Air Convention requires firstly, that an aircraft operator will have to be licensed to operate in the air, and secondly, that the aircraft itself must be licensed to carry a wireless set. An examination for aircraft operators, which is carried out by the engineering department of the General Post Office, and which is designed to correspond to the examination for the Postmaster-General's licence for the Mercantile Marine, will shortly be in force. In point of fact the aircraft operator's licence will be the first class Postmaster-General's certificate for aircraft operators, and the syllabus of examination probably will be on the lines of that laid down in Appendix V of the Postmaster-General's Handbook for Wireless Telegraphists. Examinations and inspections of wireless plant on aircraft will likewise be carried out by methods similar to those at present in force for marine craft.

Thus, in a matter of but two years hence, the advent of the large long distance passenger and freight carrying air liner has been anticipated, at any rate as far as its wireless requirements are concerned.

During 1923 the opening up of the air routes to Cologne and Guernsey have necessitated the inauguration of two further route wireless stations, and these are now operating regularly. Further details of these stations are shown in the tables in a later part of this section.

As has been previously stated, the reasons for the use of radiotelephony on the comparatively small existing commercial aircraft have been those of weight, space and rapidity of operation, and the reason for the pilot being his own wireless operator has also been due to these limitations. The instrument which has so satisfactorily performed the aircraft communication routine for the past few years is one designed by Messrs. Marconi's Wireless Telegraph Co., Ltd., and no other has yet been produced for the requirements peculiar to civil air route operations. It is known as the Combined Aircraft Wireless Telephone Transmitter and Receiver, Type A.D.2.

Naturally, though this instrument has ably done what was required of it, in the light of two or three years' air experience its designers have been able to effect several modifications and improvements. As there seems to be every possibility that the A.D.2, as it exists in its present form, will shortly be replaced by a superior type of instrument, it may be of interest to place on record some remarks concerning a set which may be justifiably said to have carried no small portion of the burden of civil aviation pioneer work.

The A.D.2 set was primarily designed for wireless communication by either telephony or telegraphy between aircraft and ground stations or between aircraft and aircraft. The main feature of the set was that both transmission and reception circuits were embodied in the same case, which

could be compactly stowed away in some convenient nook or cranny of the aeroplane. An additional small box, designed to be fitted neatly amongst the aircraft's navigation and flying control instruments, contained the controlling unit. This arrangement enabled the pilot in the air to have immediate access to only those parts of the instrument which were necessary to operate it, while, at the same time, the delicate parts of the set were safely out of the way.

The circuits were carefully screened to prevent induction from the aircraft's magnetos, and all connecting wires were covered with flexible metal braid, which was earthed to the metal parts of the machine. In the receiving circuit specially damped transformers were employed for high frequency amplification to provide stability. A variometer system of wavelength adjustment formed one of the important points of the transmitter, and allowed exact adjustment to be made to counteract any variation of capacity in different aeroplanes.

Descriptions of the instruments have already been published, and it is therefore hardly necessary to consider the set very fully. A diagram of connections is as shown hereunder :

Power is supplied from a small stream-lined wind-driven generator, both high and low tension supplies being taken off two windings running on the same shaft. The low tension supply feeds both the transmitter and receiver valve filaments and a single small accumulator is "floated" across the low tension terminals of the generator, thereby acting as a voltage regulator for variations of speed of the armature, and as a smoothing device for commutator ripple. The accumulator thus never runs down, and the apparatus is always ready for use over any length of flight. In the generator itself both armatures run in their own fields. The high tension armature delivers 0.1 ampere at 1,500 volts, and the low tension, which also feeds both fields, gives 5 amperes at about 8 volts. A highly insulated terminal is supplied for the H.T. connection, while the common negative is made off direct to the body of the machine. Two condensers of 0.5 microfarads and 0.25 microfarads, fitted in the base of the generator, act as noise eliminators for the H.T. and L.T. supplies.

The remote control unit is contained in the small box which is mounted amongst the aircraft's control gear. The box is semi-cylindrical in shape and projecting from it are three handles working side by side. These handles resemble in design other handles in the machine so that the set in appearance is in harmony with the rest of the instruments. The centre handle controls the send-receive switch and changes the high and low tension supplies and aerial and earth connections from transmitter to receiver and *vice versa* as necessary. The two outside handles are applicable to the receiving instrument only, one controlling the tuning condenser for adjusting the receiver to the wavelength of the particular ground station, or other aircraft with which it is desired to communicate, and the other being a resistance control in the filament circuit of the receiver valve, thereby being in fact a filament dimming device for allowing the pilot or operator to reduce the intensity of received speech. The remote control box is also a junction box for all connections between the other components of the apparatus and all wires are grouped in appropriate bunches and braided. Plugs are provided for these bunches as necessary, a heavily insulated one being fitted for transmitter leads and a smaller one for the reception circuits.

The transmitter itself is one of common design. A power valve with the usual reaction circuit forms the oscillatory circuit, while the control circuit contains the control valves, the choke and microphone transformer. Variometer tuning is employed and having been adjusted beforehand should need no attention whatever during a scheduled flight. A special switch is fitted which allows a certain number of turns on the aerial coil to be short-circuited

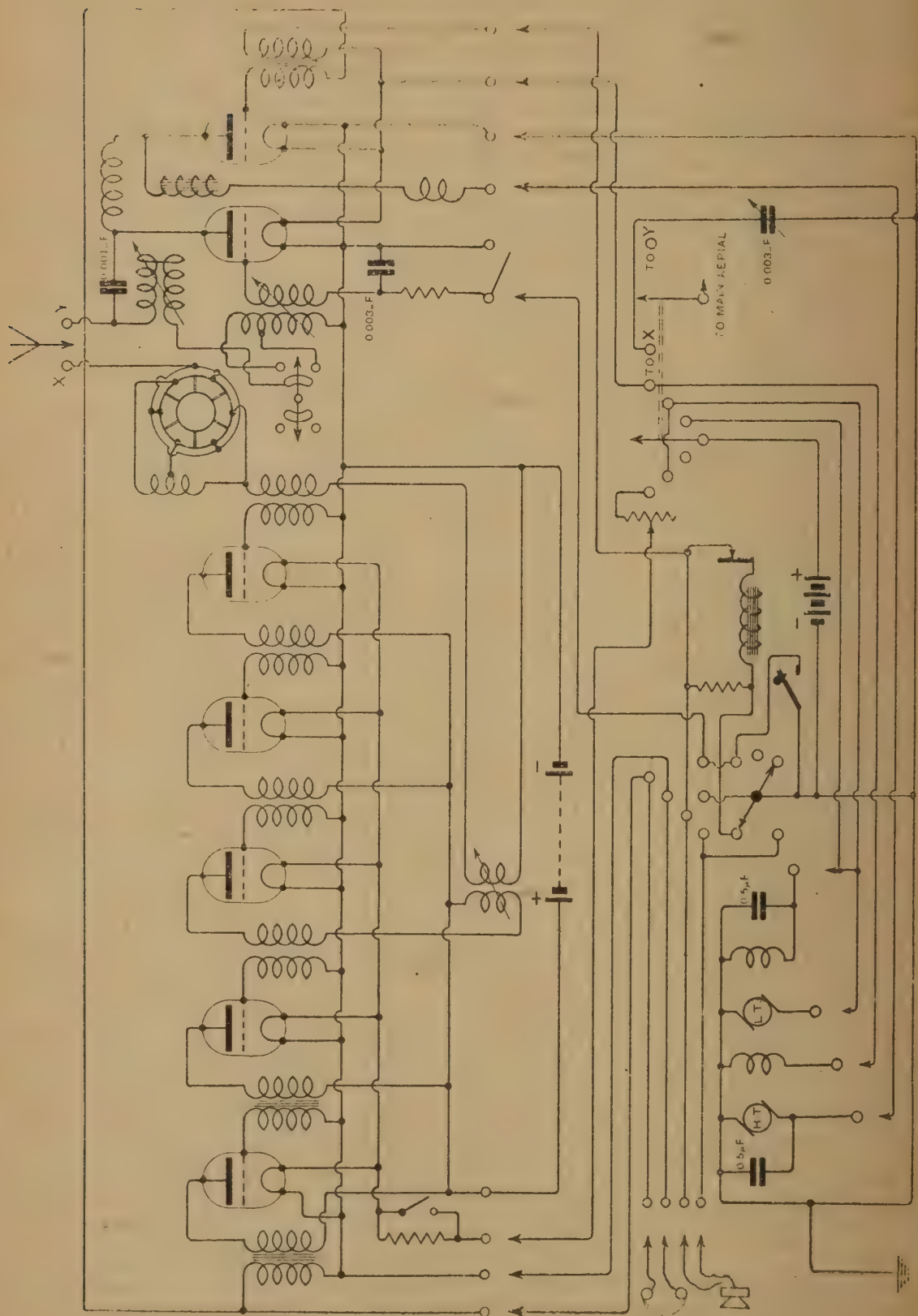


Diagram of Connections. Combined Aircraft Wireless Telephone Transmitter and Receiver. Type A.D.2.

so that transmission can be effected on two given wavelengths, which, of course, at the present time are 900 metres for aircraft routine transmissions and 600 metres for communication with ordinary ship and shore stations. In point of fact the latter wavelength of 600 metres has not been employed by aircraft operating over the recognised airways and this switch is left permanently on the 900 metre position.

The receiver embodies a five-valve circuit comprising three high frequency amplifying valves, one detector valve and one low frequency amplifying valve, or note magnifier. The aerial circuit is inductively coupled to the first high frequency valve through an "aperiodic" coil which at a loosely coupled position has a natural frequency equal to that of the 900 metre wave. As the degree of coupling is increased the mutual inductance between the two coils gives rise to two frequencies, one above and one below that of the aperiodic coil, thus allowing the secondary circuit to be tuned and giving all the advantages to be derived from a loosely coupled circuit on the standard wave, and also a comparatively wide range of other tuning. The coupling handle is pushed in or out of the box to give loose or tight coupling respectively.

Screening plays an important part in this portion of the set. The high frequency circuits are screened together and the aerial and aperiodic coils are screened from the high frequency transformers. Unwanted oscillations are consequently avoided, but the use of reaction permits of the set being employed as a self-heterodyning unit for continuous wave reception. Normally this reaction is fixed at a sensitive stable position before the aircraft leaves the ground.

The high frequency transformers themselves are highly damped, giving an elastic reaction adjustment.

Low resistance telephones are used and are connected across a step-down transformer. Side tone is employed to enable the pilot or operator to check his own transmissions.

The Morse key with a switch and buzzer also form part of the apparatus, and if required "tonic train" signals can be sent. The switch is so arranged that either telegraphy or telephony transmission can be immediately controlled by it.

Shock absorber suspensions provide for undue concussion of the various units. A simple winch contains the 200 odd feet of stranded copper aerial wire.

The weights and dimensions of this standard instrument are as follows :—

Transmitter and receiver box with H.T. battery ..	17 lbs.
Remote control	2 ..
Microphone and handle	1 ..
Telegraph unit	1½ ..
Generator and propeller	16 ..
Accumulator	7 ..
Winch and fairlead	5 ..
Aerial wire and weight	3 ..
Cables and plugs	5 ..
Head receivers	1 ..
Suspension brackets	1½ ..
Aerial ammeter	½ ..

Total 60½ lbs.

Transmitter and receiver box with H.T. battery, 14½ ins. × 6¾ ins. × 10 ins. high ;

Remote control, 5 ins. × 4¾ ins. Protection above dashboard, 3 ins.

Telegraph unit, 4½ ins. × 2¾ ins. × 2¾ ins.

As matters have stood during 1923, and as they will in all probability remain until the new telegraphic era in 1926, the whole of the accuracy of the wireless navigation of the various aircraft by direction finding methods has been vested in the ground stations concerned. This has been due to those same considerations of limited space and weight which have necessitated the continued use of the pilot-operated light weight telephone set. As is known, there are two general classes into which aircraft direction finding work may be divided :—

- (1) D.F. stations on the ground, giving bearings and position to aircraft in flight, and
- (2) D.F. apparatus within the aircraft themselves, capable of taking bearings upon known ground transmitting stations.

Hitherto scheme (1) has been exclusively employed but there is no reason why, before a few years are out, and providing suitable circuits have been designed, scheme (2) should not be in general operation. In one sense this should be an advantage because, as in the case of marine craft, the pilot or navigator in charge of the aircraft will then have all the resources of navigation possible under his own control during flight. The facilities as provided at present are, of course, available under the same conditions as those given to ships by the shore D.F. stations and take the form of an aid to regular navigation, and not as the sole means. Even so it would seem preferable to place all the methods of navigation possible immediately available to hand in the air, and as the aircraft increase their weight-carrying capacity and cruising ranges and speeds this will not only become possible but, one might say, even necessary.

Again, two main systems of direction finding in aircraft have been evolved. The first, which is the well-known "Robinson" system, consists in fitting two small frame aerials, or "coil" aerials, suitably wound for the wavelength to be used, in the fuselage of the machine, and feeding thence to the reception circuits. The system has been extensively described in various text books and further information can be readily obtained if required. The use of such small aerials naturally necessitates the introduction of a higher degree of signal amplification than would otherwise be necessary, but the arrangement, apart from being very compact and easy to manipulate, has given some very fine results.

A modification of the Bellini-Tosi system as used at Croydon and Pulham gives the other method. Two loop aerials, each symmetrically arranged, one along the wings and the other along the fuselage, are connected to fixed coils in the usual manner, and a search-coil component feeds to the receiver and amplifier.

The latter method has not so far been very extensively used, and it has yet to be proved before its general introduction can be looked upon with any degree of certainty.

Greater regularity has been maintained in the services during 1923 than in the previous year, and accidents have been, omitting the regrettable fatality on the Manchester route at Ivinghoe, a negligible quantity, so that progress continues.

The automatic landing device has still to be invented, and perhaps it may not be unreasonable to expect some advance in this direction soon. At any rate one can look forward with increased confidence to 1924.

B.—REGULATIONS & PROCEDURE —GENERAL.

I.—RADIOTELEPHONY : ORGANISATION AND PROCEDURE

SECTION I.—GENERAL REMARKS.

1. Radiotelephony equipment in aircraft, operated in conjunction with the system of ground stations, affords an efficient means of controlling air traffic. It enables pilots to report progress *en route*, to obtain meteorological information for any point of their journey, to obtain navigational aid when flying at night or in adverse weather conditions, and, in cases of distress, is an important factor in obtaining assistance. It has the additional utility of enabling inter-communication between aircraft in flight to be effected.

2. The Postmaster-General's Certificate for Radiotelephony must be held by every person operating R/T installations in civil aircraft, which Certificate will be granted after due examination. Similarly all aircraft carrying wireless apparatus must be licensed by the Postmaster-General for that purpose.

3. Conversation by radiotelephony must be as brief as possible, and for this reason it is desirable that pilots, before leaving the ground, should be in possession of the latest information available at the time of departure. The precaution of "listening-in" must be taken by every aircraft operator prior to making an initial call, in order to ensure that the station called is not already working.

SECTION II.—ORGANISATION.

1. *R/T Ground Stations*.—The radiotelephony stations available for aircraft communication, classified by their respective countries, are shown in Part III of this Notice.

2. *Language*.—When working with continental R/T stations, the language used should be that employed by the ground station worked, except in Holland where English will be used.

3. *Scope of British Stations*.—The London Terminal Aerodrome station will maintain communication with aircraft, both inward and outward bound, as far as the Continental coast, the Lympne station standing by to relay as and when necessary. In this connection it should be observed that the Continental stations also will maintain communication with aircraft, bound in each direction, as far as the English coast; thus affording the advantage to the aircraft of being in touch with the air route stations on both sides. Care must be taken, however, when making position reports, to ensure that such reports are received by both the Croydon station and the appropriate foreign station.

With the exception mentioned above, aircraft will normally communicate with the nearest ground station.

4. *Wavelength*.—The international wave band allocated exclusively for aircraft communication by either radiotelephony or radiotelegraphy is 850-950 metres. The normal wave at present used for such communication is 900 metres. Under certain circumstances, as hereafter shown, the wavelength of 600 metres may be used by aircraft for the transmission of distress signals.

5. *Call Signs*.—The R/T call sign of a ground station is the name of that station, while the international registration mark of an aircraft is also its W/T or R/T call sign.

6. *Emergency General Call Signs*.—In cases of emergency, commercial aircraft may call the nearest R.A.F. or Air Ministry civil aviation ground W/T station by using the call sign GEZ (any R.A.F. or Air Ministry civil aviation ground W/T station), and similarly any commercial ground station wishing to communicate with R.A.F. aircraft can do so by making use of the general call sign GEA (any R.A.F. aircraft). The W/T procedure to be used by commercial aircraft in this connection is shown in the subsection on Procedure. Equivalent call signs have been allocated by the French air authorities as shown :—

FNA .. Any French aircraft.

FNZ .. Any French ground W/T station.

SECTION III.—NATURE OF COMMUNICATIONS.

Communications to be assured by wireless stations (ground or aircraft) intended for air navigation must be confined to the transmission and reception only of messages necessary for ensuring the regularity of the aerial services and the safety of aircraft. (Messages dealing with the safety of aircraft will have priority). In this connection the deciding authority regarding the transmission of any message, not covered under any of the following headings, is the Civil Aviation Traffic Officer :—

1. *Distress Calls*.—The word MAYDAY will be used in making a distress call by R/T on the 900 metres wave, and its use will ensure immediate attention by all stations receiving it. A pilot making a forced landing at sea, when in communication with aircraft R/T ground stations, should make the call three times on the 900 metres wave, followed by as much information (concerning locality, nature of distress, etc.) as time allows. Upon receipt of the distress call the direction finding stations, situated at Croydon and Putnam, will at once take bearing of the aircraft concerned and will report the results to the traffic officer at Croydon, who will take all necessary steps to render immediate assistance, according to the pre-arranged scheme for such occurrences. During the time that Croydon and Putnam are taking such bearings, Lympne will concentrate on getting the whole message, it being observed that Croydon's primary object is to obtain a reliable bearing, an action which may involve the non-reception of portions of the signal.

Note.—In the case of an aircraft making a forced landing at sea when employed on special flights which take it out of range of aircraft ground R/T stations, the distress call, S.O.S., should be made on the 600 metres wave, the general ship distress wave. In this case the call should preferably be made on "interrupted continuous wave" transmission by Morse, but if no skilled telegraphist is carried the call may be made on the 600 metres wave by R/T.

2. *Navigational Aids*.—Aircraft in need of navigational assistance can obtain the following aids :—

(a) A position as plotted by bearings taken by two D/F stations.

(b) A bearing of the aircraft taken from a single D/F station.

It should be carefully observed that:—

- (i) All bearings given by D/F stations are *true*, and not *magnetic*.
- (ii) British D/F stations will not give "courses."

Full details of the radiotelephony routine for the D/F service are given in the D.F. sub-section.

3. Position Reports.

(a) Great Britain.—

Aircraft operating over British sectors of the recognised air routes will report when at the following places:—

1. London-Manchester.

(i) On the north-bound journey, on reaching a line running east and west, passing approximately through Birmingham and Rugby.

(ii) On the south-bound journey as in (i), and also on reaching a line running east and west through Watford.

2. London,-Paris, Zurich, Brussels, Rotterdam and Berlin.

- (i) Biggin Hill } Both inward and out-
- (ii) English Coast } ward bound.

(b) France.

Aircraft operating over the French sector of the London-Paris route will report to Le Bourget when at:—

- (i) French Coast.
- (ii) Abbeville.
- (iii) Beauvais.

(c) Belgium.

Aircraft operating over the Belgian sector of the London-Brussels-Cologne route will report to Brussels when at:—

- (i) Continental Coast } Both inward and
- (ii) Alost } outward bound.
- (iii) St. Trond }

(d) Holland.

Aircraft operating over the Continental sector of the London-Amsterdam route will report at:—

- (i) Continental Coast } Both inward and
- (ii) Ostend } outward bound.
- (iii) Flushing }

When leaving either coast, aircraft will announce the intended point of their arrival on the opposite coast, and any change of course while over the Channel must be immediately notified.

N.B.—Should an aircraft be flying on a course other than that generally followed on any particular airway, position reports must be made from points equivalent on that course to the position reporting points of the airway.

4. Weather Reports.—

(a) Weather reports giving the latest information from stations on the cross-Channel air routes are available for communication to pilots of machines in flight, upon demand, and are drawn up in the following form:—

Time of Observation.	Place.	General Weather and Warnings.	Visi-bility.	Height of Lowest Cloud (feet).
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(b) Places for which information is available are Biggin Hill, Lympne, Beachy Head, St. Inglevert, Abbeville, Beauvais, Compiegne, Le Bourget, Brussels, Ostend, Flushing, Rotterdam and Schiphol. Under certain bad weather conditions, reports for Grain, Deal and North Foreland, will be added.

(c) Pilots asking for "weather report for " " will be given the whole information for that place. The R/T operator in replying will follow the set order and will not read out the headings. To avoid confusion between visibility and cloud height, it should be noted that distance of visibility is always given in yards or miles and that height of lowest cloud is always given in feet. On the other hand, should the pilot ask for "Croydon visibility," the reply would be in the form "o800 Croydon 4,000 yards."

(d) In addition to the above-mentioned items, information relating to wind at various heights and places will also be available, but, as a rule, a delay of a few minutes will be necessary whilst such data, if requested, are being prepared.

5. *Report of Adverse Weather.*—Pilots *en route* encountering adverse weather conditions, of which no mention is made in the latest weather report, should transmit appropriate information to the nearest ground station for the benefit of other aircraft operating over the same route.

SECTION IV.—PROCEDURE.

1. The procedure herein laid down is applicable to both ground stations and aircraft. It has been compiled in the light of experience, and legislates for air traffic on a normal flying day.

It is essential that the correct procedure be adhered to by all concerned at all times, for, although irregularities may possibly cause no apparent delay or disorganisation when only one aircraft is flying, such irregularities will cause serious consequences when several aircraft are communicating. The Croydon R/T station is the controlling station for all R/T work on 900 metres wave within the British Isles, and, as such, its orders must be obeyed.

2. *How to call and answer.*—The method of calling up and answering is as follows:—

Continental GEXYZ wishes to establish communication with the Croydon station, and, having first ascertained that the station is disengaged, transmits:—

"Hullo Croydon, Continental GEXYZ calling Continental GEXYZ calling, message for you, over."

To which Croydon replies:—

"Hullo Continental GEXYZ, Hullo Continental GEXYZ, Croydon answering, Croydon answering, pass your message over."

NOTE (i) During communication the word "over" terminates each transmission. The words "switching-off" indicate that communication is finished.

(ii) This preliminary calling and answering is generally unnecessary in establishing touch in any of the subsequent classes of communication.

(iii) When making an initial call, the call signs of both the station called and the station calling are made twice. Communication once having been established, call signs are transmitted once only.

3. In the following paragraphs are shown examples of R/T communication between Croydon station and an aircraft belonging to the fictitious Company "Continental Airways, Limited," and flying from London to Paris. These examples give the correct procedure respecting all subjects upon which communication is necessary, with the exception of D.F.

PROCEDURE ON LEAVING THE AERODROME.

The aircraft on leaving the aerodrome calls the ground station and passes a message giving its registration marking, its aerodrome of departure and its destination.

The aircraft transmits :—

"Hullo Croydon, Hullo Croydon, Continental GEXYZ calling, Continental GEXYZ calling, London to Paris, London to Paris, how are you receiving me, how are you receiving me, over."

Croydon replies :—

"Hullo Continental GEXYZ, Hullo Continental GEXYZ, Croydon answering, understand you are bound for Paris, understand you are bound for Paris, receiving you well, receiving you well, over"

To which the aircraft answers :—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

This signal and its acknowledgment by the ground station afford a test of the machines R/T apparatus and enables the aircraft to time its receiver. If the aircraft is not receiving well the ground station must be notified and requested to speak for 30 seconds so that the aircraft operator can make any adjustments necessary.

4. *Position Report.*—The aircraft, upon reaching Biggin Hill (a reporting point):—

"Hullo Croydon, Continental GEXYZ calling, passing Biggin Hill, passing Biggin Hill, over."

Croydon answers :—

"Hullo Continental GEXYZ, Croydon answering, understand you are passing Biggin Hill, understand you are passing Biggin Hill, over."

To which the aircraft answers :—

"Hullo Croydon, Continental GEXYZ answering, that is correct, that is correct, switching off."

The machine proceeds to the coast the next reporting point, where a similar message to the above is passed.

5. *Request for Weather Report.*—The weather being unsettled the pilot may desire information regarding conditions on the French coast, prior to crossing the Channel. The request is made thus :—

"Hullo Croydon, Continental GEXYZ calling, give me weather report for French coast, give me weather report for French coast, over."

The operator at Croydon thereupon transmits the most recent report for St. Inglevert :—

"Hullo Continental GEXYZ, Croydon answering, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, weather report for 0800 St. Inglevert, slight drizzle, 3 miles, 1,000 feet, over."

This is received, duly acknowledged by the aircraft, and confirmed by the ground station.

6. *Report on Leaving Coast.*—The pilot of GEXYZ, considering the report satisfactory, leaves the English coast, reporting thus :—

"Hullo Croydon, Continental GEXYZ calling, now leaving Dover for Gris-Nez, now leaving Dover for Gris-Nez, over."

Croydon repeats message correctly, and the aircraft operator confirms it.

7. *Report of Adverse Weather.* In Mid-Channel adverse weather conditions are encountered and reported by the pilot in the following manner :—

"Hullo Croydon, Continental GEXYZ calling, clouds down to 200 feet in Channel, heavy rain squalls, clouds down to 200 feet in Channel, heavy rain squalls, over."

"Croydon repeats the message correctly and the aircraft operator confirms it."

On receipt of this signal the operator at Croydon at once notifies the Meteorological Office there.

8. *Report on reaching Continental Coast.*—The pilot, on reaching the French coast, again reports position, and here the responsibility work of the British stations ceases nominally, the Continental stations thereafter taking over control.

9. *Example of Distress Call.*—The following is an example of the procedure to be adopted in making a distress call by R/T on the 900 metres aircraft wave :—

Mayday, Mayday, Mayday, continental GEXYZ, engine trouble, about 5 miles north of Gris-Nez, Mayday, etc."

This signal is made as frequently as time allows, and should give as much information as possible regarding nature of distress, position, etc. All ground stations and aircraft hearing this call immediately cease any R/T work upon which they may be engaged, and concentrate upon receiving the full message from the distressed aircraft. The Croydon and Pulham D/F stations plot the machine's position, and report it to the Croydon traffic officer, who takes all steps with the necessary authorities to render assistance according to the pre-arranged scheme.

10. *Failure to Receive.*—Failure to receive acknowledgements should not deter an aircraft from transmitting. For instance, an aircraft may develop a fault in its wireless receiver, in which case it should not fail to continue reporting its positions at the points along the route laid down above. At the same time great care must be taken to avoid unnecessary transmission.

11. *Phonetic Alphabet.*—The following phonetic alphabet is used by Government civil aviation stations :—

A = Ac.	N = Nuts.
B = Beer.	O = Orange.
C = Charlie.	P = Pip.
D = Don.	Q = Queen.
E = Edward.	R = Robert.
F = Freddie.	S = Sugar.
G = George.	T = Toc.
H = Harry.	U = Uncle.
I = Ink.	V = Vic.
J = Johnnie.	W = William.
K = King.	X = X-ray.
L = London.	Y = Yorker.
M = Monkey.	Z = Zebra.

This alphabet should be used whenever it may become necessary to have recourse to spelling word during radiotelephonic conversations.

C.—REGULATIONS & PROCEDURE— DIRECTION FINDING.

II. —WIRELESS DIRECTION FINDING SERVICES : BRITISH ISLES, FRANCE, GERMANY AND ITALY.

GENERAL REMARKS.

1. Since, in giving an aircraft a bearing, reference is made to the time at which the readings are taken, it is essential that the aircraft's watch should be absolutely accurate. If there is any doubt as to the accuracy of the watch, a check should be at once carried out by calling the nearest route ground station, and obtaining the exact time (G.M.T. or B.S.T., as the case may be).

2. In order to avoid unnecessary interference and any consequent confusion or delay, an aircraft operator must invariably "listen in" before calling a station, to ensure that that station is not already engaged.

3. The bearings given by British aircraft D.F. stations may be accepted as accurate to within two degrees. Occasions may arise, however, when, owing to atmospheric conditions or interference, the operator at one or more of the ground stations may be dissatisfied with the accuracy of a bearing he has taken, and at the same time be unable to improve upon it. In order to differentiate between classes of bearings and positions the designation "first-class bearing or position" and "second-class bearing or position" will be applied. A position given to an aircraft with remark may be assumed to be the result of first-class bearings at all stations. Whenever a second-class bearing is obtained by any ground station the resultant position passed to the aircraft will be qualified as a second-class position. Traffic officers are empowered to refuse either bearings or positions to aircraft in exceptionally unfavourable conditions.

4. The D/F stations available for use by aircraft and the procedure to be employed are grouped by countries hereunder.

SECTION I.—BRITISH ISLES.

(a) Stations.

See also Directory Section—Land.

Croydon	..	Aircraft only.
Pulham	..	Aircraft only.
Berwick	..	—
Flamborough	..	201°, 310 yds. from Flam- borough Head Lighthouse.
Lizard	..	—

(b) Telephony Procedure.

(i) *In conjunction with Croydon and Pulham.*—The procedure, when using R/T, for an aircraft desiring to obtain its position by means of cross bearings from Croydon and Pulham, is as follows:—

Example.

Aircraft GEXYZ belonging to "Continental Airways, Ltd.," wishes to ascertain its position.

1st Action.

Aircraft calls Croydon and asks for its position:—

"Hullo Croydon, Continental, GEXYZ calling, position required, position required, over."

2nd Action.

Croydon replies:—

"Hullo Continental, GEXYZ, Croydon answering, Righto, Righto, speak for half a minute."

(In the event of other aircraft talking Croydon will order them to cease work until called, and THEY SHOULD IMMEDIATELY DO SO.) The reply "Righto" means that the stations are ready to take the bearings.

3rd Action.

The aircraft operator then speaks for half a minute, remembering that the stations are paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Pulham passes its bearing to Croydon. Croydon repeats back and passes its bearing to Pulham for check.

5th Action.

Croydon plots the position of the aircraft in conjunction with Pulham's bearing, and continues:—

"Hullo Continental GEXYZ, Croydon calling, position 2 miles true north of Canterbury at 1509, position 2 miles true north of Canterbury, at 1509, over."

6th Action.

Aircraft replies:—

"Hullo Croydon, Continental GEXYZ answering, understand position 2 miles north of Canterbury at 1509, position 2 miles north of Canterbury at 1509, over."

7th Action.

Croydon replies:—

"Hullo Continental GEXYZ, Croydon answering that is correct, that is correct, switching off."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate direct with an aircraft when it is flying north of London and is out of range of Croydon.

(ii) *In conjunction with either Croydon or Pulham only.*—The procedure, when using R/T, for an aircraft desiring to obtain a single bearing from Croydon or Pulham is as follows:—

Example.

Aircraft GEXYZ wishes to obtain a bearing from Croydon.

1st Action.

Aircraft GEXYZ calls Croydon and asks for its bearing:—

"Hullo Croydon, Continental GEXYZ calling, bearing required, bearing required, over."

2nd Action.

Unless Croydon has already obtained a satisfactory bearing that station replies :—

"Hullo Continental GEXYZ, Croydon answering, Righto, Righto, speak for half-minute, speak for half-minute, over."

3rd Action.

The aircraft then speaks for half a minute, remembering that Croydon is paying no attention to the actual words, and would not, therefore, hear if anything of importance were passed.

4th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, true bearing 110 degrees at 1509, true bearing 110 degrees at 1509, over."

5th Action.

The aeroplane replies :—

"Hullo Croydon, Continental GEXYZ answering, understand true bearing 110 degrees at 1509, GEXYZ, understand true bearing 110 degrees at 1509, over."

6th Action.

Croydon replies :—

"Hullo Continental GEXYZ, Croydon answering, that is correct, that is correct, switching off."

(c) Morse Procedure.

(i) The following abbreviations are to be used :—

Signal	Meaning.
QTE ?	"What is my true bearing from you (or from) ?"
QTE	"Your true bearing from me (or from) was..... degrees."
QTF ?	"What is my position determined by cross bearings from..... ?"
QTF	"Your position determined by cross-bearings from..... is"
QSY ?	"Shall I transmit with a wavelength of.....metres ?"
QSY	"Change over to wavelength of..... metres."

(ii) In conjunction with Croydon and Pulham.

Example.

An aircraft GEXYZ using Morse procedure requires to ascertain its position as determined by cross bearings from Croydon and Pulham.

1st Action.

The aircraft calls Croydon :—

"CT GED GED GED de GEXYZ GEXYZ GEXYZ QTF UD QTF UD AR."

2nd Action.

Croydon communicates with Pulham, and when the latter station is ready, makes to the aircraft :—

"CT GEXYZ de GED K."

3rd Action.

On receipt of "K" the aircraft then makes :—

"CT GED de GEXYZ GEXYZ, (for 30 seconds)....GEXYZ."

4th Action.

Pulham passes its bearing to Croydon, and Croydon repeats back.

5th Action.

Croydon plots the position of the aircraft with her own and Pulham's bearing, and replies to the aircraft :—

"CT GEXYZ de GED QTF 2 miles true north of Canterbury at 1509 AR."

6th Action.

In order to confirm to Croydon that the aircraft has received the position correctly, she will repeat it back to Croydon :—

"CT GED de GEXYZ QTF 2 miles north of Canterbury at 1509 AR."

7th Action.

If the aircraft has received the position correctly Croydon will acknowledge, making the "end of work sign" :—

"CT GEXYZ de GED R VA."

NOTE.—In the event of repetitions being required by Croydon or Pulham, these will be asked for by Croydon only. Pulham will only communicate with an aircraft direct when it is flying north of London and is out of range of Croydon.

The procedure for obtaining a single bearing from one station only is similar to that outlined in the 1st Action of the above example, except that QTF is replaced by QTE.

(iii) In conjunction with other Ground Stations.

In the case of the other ground stations, if cross bearings are required to determine an aircraft's position, the stations should be called up together and the bearings taken in one operation. The aircraft calls the station or stations on the appropriate wave, making "QTE ?" in conjunction with the call signals of the stations from which bearings are required. The station or stations called, when ready, answer in alphabetical order of their call signs, and make "K" ("go on").

Example.

An aircraft, whose call sign is GEXYZ, required a bearing from Berwick (BVG) and Flamborough (BVN).

1st Action.

The aircraft makes on 450 metres :—

"CT BVG BVG BVN BVN de GEXYZ GEXYZ QTE UD AR."

2nd Action.

On receiving "K" from each station, the aircraft makes her own call signal for 60 seconds, and awaits the result.

3rd Action.

The stations reply (in alphabetical order of call signs) either asking the aircraft to repeat (UD) or giving the result. The result is given by the signal QTE, followed by the call signal of the D/F station, and by a group of three figures (000 to 359), indicating the true bearing from 000° to 359° of the aircraft from the station, reckoning clockwise from North (e.g. North = 000°, West = 270°). The result is given in the form :—

"CT GEXYZ GEXYZ de BVG 9.45 M (time) BT QTE BVG 092 AR." followed by :—

"CT GEXYZ GEXYZ de BVN 9.45 M (time) BT QTE BVN 045 AR."

4th Action.

The aircraft, on receiving the result, acknowledges receipt in the ordinary way, repeating the bearing received from each station and makes VA ("end of work" sign). This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume normal watch.

NOTE.—The letter M or S. following the time in the bearing signal denotes that the time stated is A.M. or P.M. respectively.

(d) General.

It should be noted that R/T will not normally be used for D.F. purpose for communicating with stations other than Croydon and Pulham.

SECTION II.—FRANCE.

(a) Stations.

See also Directory Section—Land.

Bernieres ..	—
Berre ..	—
Bizerte ..	—
Brest-Moulin du Seigneur	Service temporarily suspended.
Casablanca D.F. (Morocco)	Replies through Casablanca (CNP).
Cherbourg ..	The D.F. station works in conjunction with the ordinary W.T. traffic station.
Kenitra (Morocco)	—
Lorient ..	—
Marseille ..	—
Ouessant-Pen ar Roch	Replies through Ouessant (FFV)
Penmarch ..	—
Pointe du Raz	—
St. Nazaire ..	—
Soubise (Rochefort)	—
Toulon-la-Mitre	—
Treguier St. Gonery	—

(b) General.

At the present time no D.F. stations are being worked in France for purely aircraft purposes, the above mentioned stations being those operated primarily for the benefit of marine craft.

French D/F stations of small power keep watch on the wavelength of 600 metres; this wave must be used in all cases by aircraft for calling French ground stations in order to obtain bearings.

The ground station called replies on the 600 metres wave. The wave upon which the bearing is given can be either 450 metres or 800 metres, at the choice of the aircraft, which choice should be indicated in making the first call. The wavelength of 600 metres can be similarly utilised by aircraft which are not able to transmit and receive on 450 metres or 800 metres.

The results of observations are transmitted by the ground station on whichever wave is chosen. It should be noted, however, that Toulon and Casablanca always transmit bearings on 800 metres, irrespective of the wavelength upon which the bearing is taken.

The charge in respect of each bearing sent out by a French D/F station is six francs. The charges will be collected in the same manner as for wireless telegrams originating from ships.

(c) Procedure.

(i) The procedure is similar to that laid down for British D/F stations. The abbreviations to be used are:—

QTE? "What is my true bearing from you (or from.....)?"

QTE "Your true bearing from me (or from.....) is....."

The bearings are indicated by a group of three figures from 000 to 359, reckoning clockwise from North (North = 000°, West = 270°).

The procedure is to be observed as follows:—

1st Action.

The aircraft calls the station, or stations, on 600 metres, and transmits the signal "QTE?" followed by the call signs of all the stations from which it requires bearings, and giving the wavelength upon which it desires the bearings to be given. It then listens in on 600 metres

2nd Action.

The ground stations called prepare to take bearings and, when ready, reply in alphabetical orders of their call signs, instructing the aircraft, by the signal "K," to commence its transmission; the letter "K" is followed by a number giving the strength of the aircraft's signals as received by the ground station.

3rd Action.

On receiving the signal "K" the aircraft adjusts its transmitting gear to the wavelength chosen and transmits its call sign for 50 seconds. It then "listens in" on that wave.

4th Action.

The stations reply in alphabetical order of their call signs, either asking for the aircraft signal to be repeated, or giving the results of their observations by the signal "QTE" followed by a group of three figures indicating the bearing.

Example.

An aircraft GEXYZ requires bearings from Moulin du Seigneur (FEI) and Ouessant-Pen ar Roch (FEO). It desires to use the wavelength of 450 metres. The different operations will take place in the following order:—

1st Action.

GEXYZ calls the two stations on 600 metres:

"VE FEI FEI FEO FEO V GEXYZ

QTE? FEI FEO 450 AR."

2nd Action.

GEXYZ having transmitted this signal listens on 600 metres.

3rd Action.

FEI replies on 600 metres:—

"VE GEXYZ V FEI 450 K6."

4th Action.

FEO replies on 600 metres:—

"VE GEXYZ V FEO 450 K7."

5th Action.

FEI and FEO adjust their instruments to 450 metres.

6th Action.

GEXYZ adjusts its transmitter to 450 metres and signals :—

" \overline{VE} FEI FEO V GEXYZ GEXYZ GEXYZ.....(for 50 seconds) \overline{AR} ."

7th Action.

GEXYZ having transmitted this signal listens on 450 metres.

(the two stations having made their observations have, say, obtained the following results at 1545 G.M.T. :—
FEI 330° FEO 093° .)

8th Action.

FEI thereupon signals on 450 metres :—

" \overline{VE} GEXYZ V FEI I \overline{BT} 1545 QTE 330 \overline{AR} FEI."

9th Action.

GEXYZ having received this signal acknowledges receipt by transmitting :—

" \overline{VE} FEI V GEXYZ R II \overline{VA} ."

10th Action.

FEO transmits on 450 metres :—

" \overline{VE} GEXYZ V FEO 3 \overline{BT} 1545 QTE 010 \overline{AR} FEO."

11th Action.

GEXYZ having received this signal acknowledges receipt by sending :—

" \overline{VE} FEO V GEXYZ R II \overline{VA} ."

12th Action.

The stations repeat \overline{VA} , and then all resume their normal watch.

NOTE.—The numbers 1 and 3 having the sign \overline{BT} represent the number of the record on the stations' registers. The number 1545 refers to the Civil Mean Time of the Meridian of Greenwich.

If one of the stations (FEO for example) desires repetition, not having obtained a correct observation on the first transmission, it makes the signal :—

" \overline{VE} GEXYZ V FEO \overline{UD} ."

The aircraft then repeats the transmission of its call sign for a further 50 seconds, after which the remainder of the operation is as described above.

SECTION III.—GERMANY.

(a) Stations.

See also Directory Section—Land.

Borkum —
List —
Nordholz —
Wilhelmshaven Control Station.

(b) Procedure.

The stations belong to the State Marine, and are available for public use only when not in use by the Navy.

An aircraft requiring bearings should call Wilhelmshaven W/T station on a damped wave of 600 metres. That station makes the necessary arrangements with the D/F stations, and communicates the bearings or the position ascertained in latitude and longitude to the aircraft concerned. The D/F stations correspond with aircraft of other countries only through Wilhelmshaven station.

Example (i).

1st Action.

The aircraft calls the control station on 600 metres, and having established communication makes :—

" \overline{CT} KAN de GEXYZ \overline{BT} QTE QSY 600 \overline{AR} ."

2nd Action.

The control station answers and tells the aircraft to wait :—

" \overline{CT} GEXYZ de KAN \overline{VE} \overline{AS} ."

3rd Action.

The control station calls the three D/F stations on another wave, and, when they are ready to take bearings, makes :—

" \overline{CT} GEXYZ de KAN \overline{BT} BITTE VV GEBEN \overline{AR} " ("Please send V's").

4th Action.

The aircraft then sends V's as requested :—

" \overline{CT} KAN de GEXYZ \overline{BT} V's (for 60 seconds) GEXYZ \overline{AR} ."

5th Action.

The control station collects the results on a different wave, and transmits them to the aircraft :—

" \overline{CT} GEXYZ de KAN \overline{BT} QTE 1018 (time) \overline{BT} KBO 012 (bearing) \overline{BT} KBQ 247 \overline{BT} KAO 350 \overline{VE} \overline{UD} \overline{AR} K."

6th Action.

If the aircraft has received the bearings, she replies :—

" \overline{CT} KAN de GEXYZ \overline{VE} \overline{VE} \overline{AR} \overline{VA} ."

7th Action.

The control station then makes :—

" \overline{CT} GEXYZ de KAN \overline{VE} \overline{VE} \overline{VA} ."

NOTE.—In the event of the aircraft requiring a repetition of the bearings, \overline{UD} will be substituted for \overline{VE} in the 6th Action above.

Example (ii).

An aircraft (call sign GEXYZ) requiring to ascertain her position by means of bearings from the three stations, the following procedure is to be employed :—

With the exception that QTF is substituted for QTE, the procedure is as in the first four Actions of Example (i) above until the three stations have passed the bearings to KAN.

5th Action.

KAN then makes to GEXYZ :—

"CT GEXYZ de KAN BT QTF 1018
(Your position at 1018) IST.....
GRAD (is.....degrees.....)
MIN.....SEK NORD-BREITE.....
(mins.....secs.....north latitude) ...
GRAD.....MIN.....SEK..
OST-LANGE.....(degrees.....
minutes.....seconds.....east
longitude) AR K."

6th Action (et seq).

The procedure is then as in the last two actions of Example (i) above.

NOTE.—Mid-European time is used, the hours and minutes being expressed in four figures from 0001 to 2359.

SECTION III.—ITALY.

(a) Station.

See also Directory Section—Land.

Murano

NOTE.—Bearings from this station are to be obtained by calling Carbonera (ICZ) on 600 metres, and are transmitted for Murano by Carbonera.

A charge of six francs is made for each bearing transmitted by an Italian W/T D/F station. The charges are collected in the same manner as for wireless telegrams originating from ships.

(b) Procedure.

The procedure is as follows :—

An aircraft whose call signal is GEXYZ wishes a bearing.

1st Action.

On a wave of 600 metres she will signal :—

"CT ICZ ICZ de GEXYZ QTE?"

2nd Action.

Carbonera will answer :—

"CT GEXYZ de ICZ AS."

3rd Action.

Carbonera then wires Murano; when ready, Carbonera replies :—

"CT GEXYZ de ICZ K."

4th Action.

GEXYZ after 30 seconds signals :—

"CT ICZ de GEXYZ GEXYZ GEXYZ, etc." for 45 seconds.

(If dissatisfied with the bearing, Murano through Carbonera, will ask the aircraft to repeat.

Carbonera signals :—

CT GEXYZ de ICZ UD.

GEXYZ repeats the signal as given above.)

5th Action.

When satisfied with the bearing, which is assumed to be 170° at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the aircraft as follows :—

"CT GEXYZ de ICZ de IRM 9.45 M BT
QTE 170 AR ICZ."

6th Action.

GEXYZ acknowledges receipt :—

"CT ICZ de GEXYZ R VA."

D.—AVIATION STATIONS.

A—ORGANISATION.

A.—ORGANISATION.

(1) The wireless services existing for the benefit of the civil air routes are carried out on three separate wavelengths :—

(a) 900 metres, which is reserved exclusively for ground-air communication.

(b) 1,680 metres, which is used for Route Weather messages.

(c) 1,400 metres, which is used for Route Traffic messages.

(2) The uses of the 1,400 metres wave are as follows :—

(a) Aircraft arrivals and departures—Procedure.

(i) *Arrivals.*—The Civil Aviation Traffic Officers in charge of the various route aerodromes will report all arrivals of aircraft at the stations under their control to :—

(a) The Officer in charge of the aerodrome from which the aircraft started.

(b) The aircraft owners representative on the aerodrome. For aircraft landing *en route*, notifications are sent to the aerodrome of departure and the aerodrome of destination.

(ii) *Departures.*—The departure of an aircraft is reported to the Officer in Charge of the aerodrome of destination. When a

machine which has landed *en route* resumes its flight, notification will be sent to both the aerodrome of departure and the aerodrome of destination.

(2) *Traffic Messages—Compilation and disposal of.*

(i) *Departure Messages.*—Messages announcing departures will contain the following information in the order shown:—

- (a) The aircraft registration marking.
- (b) The pilot's name.
- (c) The aerodrome of destination.
- (d) The time of departure.
- (e) The aircraft's load.

An example of this type of message would be:

"GEXYZ, Jones left for Paris 1000, five passengers, mail 100 lbs. goods."

(ii) *Arrival Messages.*—Messages announcing arrivals will contain the following information in the order shown:

- (a) Aircraft's registration marking.
- (b) The time of arrival.

A typical message of this kind would be:—

"GEXYZ arrived 1210.

(3) *Priority Traffic.*—The following organisation is laid down for dealing with traffic of an urgent nature between the London Terminal Aerodrome and other termini:—

(a) *Prefixes.*—Messages of this nature are of two classes.

(i) Very urgent messages for which it is necessary to take special measures. This class will be known as "First class priority messages" and will be prefixed by the letter "P."

(ii) Messages of Security and Regularity. (e.g. arrivals and departures) the transmission of which will always be given priority over ordinary messages dealing with the operations of the various air lines. This priority will be known as "Second Class priority," and will be prefixed by the letter "D."

b) *Authority.*

(i) The Officer in Charge of the aerodrome of origin of a message is the *only* person empowered to authorise the despatch of a message as "First Class priority."

(ii) "Second Class priority" will be given to a message falling in that category by the Traffic Officer on duty at the time of despatch.

(c) *Scope.*

(i) The use of the "First Class" priority prefix will be limited to *urgent messages of safety, upon which immediate action is imperative*; as for example, messages containing instructions to prevent the departure of an aircraft for reasons of safety or messages ordering the recall of an aircraft which has already left. Under no circumstances will it be used for messages other than those concerned with the safety of life and with the safe conduct of the airways.

(ii) The "First Class" priority prefix will be applied regularly to route traffic messages of arrivals and departures, and will serve to ensure the rapid despatch and reception of these messages in preference of ordinary messages dealing with the operation of the various Air Transport Companies.

(4) *Interruption by Service.*—In the event of the wireless service between the different termini becoming interrupted for any reason, the following action is taken by the Officer in Charge of each terminal aerodrome:—

(i) A letter is handed to the pilot of any aircraft about to depart, addressed to the Officer in Charge at the aerodrome of destination, containing a recapitulation of arrivals and departures already carried out along the line and, if possible, information concerning departures likely to occur.

(ii) Simultaneously the normal routine for dealing with messages between the terminal aerodromes is carried out by the Officer in Charge, Croydon. These messages are passed in the ordinary manner to the Air Ministry Wireless Station, where they are bunched and despatched by cable to the following telegraphic addresses:—

(a) Port Aerien du Bourget.

(b) Port Aerien, Bruxelles.

(c) Instone, Bickendorf Aerodrome, Cologne.

(d) Haven-meester Luchtvaart, Rotterdam; or Transaera, Amsterdam.

At about 1500 or 1800 hours, or as necessity arises, consolidated messages dealing with the arrivals and departures at following aerodromes, are cabled by the following air administrations, addressed to: "Wireless, Air Ministry, London," where necessary action is taken for their disposal. All such messages will be repeated by W/T as soon as wireless communication is re-established.

(5) *Calibration.* In order to ensure regularity and uniformity of signalling on the 1,400 metre wavelength (and also on other wavelengths connected with civil aircraft routines) a system of calibrated wave transmissions is carried out by the Air Ministry Wireless Station.

B—WIRELESS TELEGRAPHY STATIONS IN OPERATION IN CONNECTION WITH CIVIL AIR ROUTES.

GENERAL REMARKS.

The information given in these tables relates only to stations, either situated actually upon aerodromes, or whose routine is directly concerned with flying operations and is primarily intended for aircraft.

Certain routine transmission by these stations are only carried out during that portion of the year when additional air services are being run owing to longer periods of daylight. Such transmissions are shown hereafter marked with an asterisk.

Details of those W/T stations whose meteorological routine is not primarily intended for aircraft, but which may indirectly have bearing

upon the operation of the air routes, are given in Meteorological Office Publication 252, which can be obtained from H.M. Stationery Office, or directly from the Meteorological Office, Air Ministry, price 2s. 6d.

The procedure to be adopted for W/T (Morse) communication between aircraft and the ground stations of the countries hereafter mentioned is as laid down in the "Handbook for Wireless Telegraph Operators of H.M. Postmaster-General" obtainable through any bookseller or from H.M. Stationery Office, price 6d.

Unless otherwise stated all stations use a C.W. system, and all times quoted are G.M.T.

SECTION I.—BRITISH ISLES.

SEE ALSO DIRECTORY SECTION—LAND STATIONS.

Station.	Wavelength in Metres.	Routine.
Air Ministry	900	<i>Wave calibration.</i>
	1400	<i>Route Traffic Messages with Le Bourget, Brussels, Rotterdam and Cologne as necessary.</i>
	1680	<i>Hourly Route Meteor. Messages are transmitted daily at 0336*, 0436*, 0536*, 0636*, 0736, 0836, 0936, 1036, 1136, 1236, 1336, 1436, 1536, 1636.</i>
	4100*	<i>Meteorological Synoptic Reports are issued daily at 0200, 0600, 0800, 1400, 1900. Weather Shipping Reports are issued daily at 0900 and 2000. European Collective Weather Reports are issued daily at 0850 and 1450.</i> In addition, the station makes a series of calibrated wave transmissions addressed to "CQ" daily as shown:— (1) At 0750, on 900 metres, a series of figures 1 (● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds. (2) At 0745, on 1,400 metres, a series of figures 2 (● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds. (3) At 0800, on 1,680 metres, a series of figures 3 (● ● ● ———) for 30 seconds, followed by a dash (—) lasting 5 seconds. Immediately following each 5-second dash, any necessary corrections will be transmitted as follows:— <i>Indicating figure for the Wave (i.e., "1," "2") BT followed by a four-figure group indicating the actual wave transmitted.</i> If no correction is necessary VA will be made after each 5-second dash. <i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Meteor. Messages to Air Ministry at 0702, 1302, 1602, 1702, 1902.</i> <i>Radiotelephonic communication with aircraft in flight (Croydon is the control station for this routine within the British Isles).</i> <i>D.F. Service for aircraft.</i> <i>W/T Routine as necessary.</i> <i>Radiotelegraphic communication with aircraft in flight.</i> <i>As necessary.</i> <i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Meteor. Messages to Air Ministry at 0700, 0800, 1300, 1600, 1700 and 1800 daily.</i> <i>Radiotelephonic communication with aircraft in flight.</i> <i>W/T Routine as necessary.</i> <i>D.F. work with Croydon.</i>
Castle Bromwich Aerodrome	900	
	1300	
Croydon (Air Port of London)	900	
	900	
Guernsey	900	
	1300	
Manchester Aerodrome	900	
	1300	
Lympe Aerodrome ..	900	
	900	
Pulham Aerodrome ..	900	
	900	

* N.B.—In cases where delay in commencing transmission on 4,100 metres is occasioned, should transmission not have been commenced at the expiration of ten minutes, the message will be issued on 1,400 metres commencing at ten minutes after the routine hour.

§ Navigational warnings to airmen, as referred to in N. to A. No. 25 of 1922, are issued, when required, after the routine Synoptic Reports. Transmission is made on 4,100 metres (not 1,400 metres), and the above-mentioned N. to A. is amended accordingly.

SECTION I.—BRITISH ISLES—continued.

Station.	Wavelength in Metres.	Routine.
Renfrew Aerodrome ..	900 1300	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Meteor. Messages to Air Ministry at 0705, 1005, 1305, 1605, 1805.</i>
Bickendorf Aerodrome (Cologne). This station in Rhineland Occupied Territory is temporarily staffed and operated by the Department of Civil Aviation, Air Ministry	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages with Air Ministry (GFA) and Brussels (OPVH) as necessary.</i> <i>Hourly Route Weather Messages are issued at 0916, 1016, 1116, 1216, 1316, 1416, 1516 daily. The station is open from 0900-1600.</i>
Lerwick (Meteorological observatory).	600 (Spark) 1400 (Spark)	<i>Communication with Wick for G.P.O. in cases of necessity.</i> <i>Meteor. Routine as requisite.</i>
Any R.A.F. or Civil Aviation Ground W/T Station.	—	The procedure for using this general call sign is as shown in the following example:— Aircraft G—EXYZ is about to make a forced landing and wishes to communicate with the nearest R.A.F. W/T station. The aircraft makes (in all cases stating its approximate position):— CT GEZ GEZ GEZ de GEXYZ GEXYZ GEXYZ BT OVER ASHFORD 1400 aaa ENGINE TROUBLE AR. The nearest R.A.F. W/T station will then reply, using the call sign GEZ and stating its name, thus:— CT GEXYZ GEXYZ GEXYZ de GEZ GEZ GEZ BT HAWKINGE ANSWERING AR.

SECTION II.—BELGIUM.

Station	Wavelength in Metres.	Routine.
Haren (Air Port of Brussels)	900 1400	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i>
Ostende (Aerodrome) ..	1400 1680	<i>Route Traffic as necessary.</i> <i>Hourly Route Meteor. Messages at 0422, 0522, 0622, and every hour and 22 minutes till 1622.</i>
Brussels (Royal Meteor. Institute)	1680	<i>Meteor. Messages at 0422*, 0522*, 0622*, 0722, 0822, 0922, 1022, 1122, 1222, 1322, 1422, 1522, 1622.</i>

SECTION III.—FRANCE.

Station.	Wavelength in Metres.	Routine.
Le Bourget (Air Port of Paris)	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic as necessary.</i> <i>Hourly Route Weather Messages at 0328*, 0428*, 0528*, 0628*, 0728, 0828, 0928, 1028, 1128, 1228, 1328, 1428, 1528, 1628.</i>
St. Inglevert Aerodrome	900 1400 1680	<i>Radiotelephonic communication with aircraft in flight.</i> <i>Route Traffic Messages as necessary.</i> <i>Hourly Route Weather Messages at 0508*, 0608*, 0708, 0808, 0908, 1008, 1108, 1208, 1308, 1408, 1508, 1608.</i>
Abbeville	900 1400 1680	<i>R/T communication with aircraft in flight.</i> <i>Route Traffic as necessary.</i> <i>Hourly Route Meteor. Messages at 0502-1802, inclusive.</i>
Antibes	1680	<i>Route Traffic as necessary.</i>
Bayonne	1300	<i>Meteor. Messages at 0710, 0910, 1115, 1310, 1810.</i> <i>Route Traffic as necessary.</i>
Bordeaux	1300 1500	<i>Meteor. Messages at 0715, 0945, 1315, 1815.</i> <i>Route Traffic Messages as necessary.</i>
Dijon	1400	<i>Meteor. Messages.</i> <i>Traffic as necessary.</i> <i>Meteor. Messages at 0715, 0945, 1315.</i>

SECTION III.—FRANCE—continued.

Station.	Wavelength in Metres.	Routine.
Lyoa	1400	<i>Route Traffic Messages</i> as necessary. <i>Meteor. Messages</i> at 0640, 0710, 1310, 1800.
Marignane .. .	1680	<i>Route Traffic</i> as necessary. <i>Meteor. Messages</i> at 0724, 0953, 1324, 1824.
Montelimar .. .	1680	<i>Meteor. Messages</i> only at 0700, 0930, 1300 and 1800.
Nancy	1400 1450	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0515, 0615, 0715, 0915, 1015, 1115, 1315 and 1815.
Nîmes	1680	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0706, 0936, 1110, 1306, 1806.
Perpignan .. .	1300	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0710, 0910, 1110, 1310, 1810.
Remilly-sur-Seine ..	1400	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0618, 0718, 0818, 0918, 1018, 1118, 1318.
Strasbourg .. .	1400 1720 1720 or 2500	<i>Traffic</i> as necessary. <i>Meteor. Messages</i> at 0505, 0605, 0710, 0905, 1005, 1305, and 1805. <i>Traffic</i> with Prague.
Toulouse.. .. .	1300	<i>Traffic</i> as necessary. <i>Meteor. Message</i> at 1105.
Valenciennes .. .	1200 1400	<i>Route Traffic</i> as necessary. <i>Hourly Meteor. Messages</i> at 0540, 6605, 0705, 0805, 0905, 1105, 1205, 1305, 1405, 1505, 1605.

SECTION IV.—HOLLAND.

Station.	Wavelength in Metres.	Routine.
Soesterberg .. .	1680	<i>Meteor. Route Messages</i> are issued daily at 0744, 0844, 0944, 1044, 1144, 1244, and 1344.
Rotterdam .. .	900 1400	<i>Radiotelephonic communication</i> with aircraft in flight. <i>Route Traffic Messages.</i>

UNITED STATES OF AMERICA.

The Postal Radio Service is owned and operated by the Post Office Department.

The United States Air Mail Service has been experimenting with aircraft radio since February, 1919. Its principal efforts have been directed to the solution of the problem of Radio Direction Finding and Radio Field Localising. The solution of these problems has been pursued with the aid of the Bureau of Standards and data furnished by the Navy Department, with considerable original research by the Air Mail Service. A simplified Radio Direction Finder, based on the Robinson principle of fixed A and B coils, was evolved, and has been practically applied to single-manned planes of this service. Pilots with no previous experience have flown directly over the radio stations at destination by this means.

The problem of field localising jointly solved by the Air Mail Service and the Bureau of Standards, has resulted in the discovery and practical application of the so-called Radio Frequency

Field Localiser System. This system is brief, consists of two large horizontal single-turn coils in which radio frequency currents flow in opposite directions. As a result, the electro-magnetic field extends upwards in an expanding cone. An aeroplane utilising radio direction finding during periods of poor visibility can, of course, fly to the vicinity of the landing field. From this point the field localiser directs them to the immediate vicinity of the field itself.

During August, 1920, it was found that telegraph communication could not be furnished for the trans-continental Air Mail Service. As a result, it was decided on August 20th to install a chain of radio stations across the continent, tying in each of the Air Mail Fields.

There are eleven of these stations installed on or near various Air Mail fields. Those in operation are (1) College Park Md. 2 kw. Quenched Spark; (2) Bellefonte, Pa. 5 kw. Quenched Spark; (3) Omaha, Neb., 6 kw. Quenched Spark; (4) Cheyenne, Wyo., 2 kw. Arc.

Stations located at the following points have been in operation since October 15th :—(1) Salt Lake City, Utah, 2 kw. Arc ; (2) Elko, Nevada, 2 kw. Arc ; (3) Reno, Nevada, 2 kw. Arc. The following stations were completed on November 1st 1920 :—(1) St. Louis, Mo., 5 kw. Quenched Spark ; (2) North Platte, Nebr., 2 kw. Arc ; (3) Rock Springs, Wyo., 2 kw. Arc.

These stations are not only used for inter-station traffic, but are also utilised for aeroplane radio communication and radio direction finding.

It is proposed to utilise all the radio stations of the Air Mail Service for Radio Research work, such as investigation of shifting signals, static and other kindred problems.

GERMANY.

The Koenigs Wusterhausen Station (Call Letters, LP) sends out notices for aircraft on a 3,600-metre wave at 1010 and 2010.

Additional information relating to Aircraft Wireless is contained in the Laws and Regulations section.



AIR MINISTRY CIVIL AVIATION RADIO STATIONS.



MAP OF THE LONDON TO PARIS, BRUSSELS, COLOGNE AIRWAYS.

E. TABLE OF MARKS

The nationality mark of the State named below applies to the aircraft of its Dominions, Colonies, Protectorates, Dependencies, or of countries of which it is the Mandatory Power.

Country.	Nationality Mark.	Registration of Marks.
United States of America ..	N	All communications made in accordance with the provisions of Section 1 (A) using a group of four letters out of the 26 of the alphabet, each group containing at least one vowel—e.g., ADCJ, PURN
British Empire	G	
France	F	
Italy	I	
Japan	J	
Bolivia	C	All communications made with B as first letter. " " " C " " " " P " " " " R " " " " U " " " " B " " " " G " " " " L " " " " B " " " " P " " " " P " " " " B "
Cuba	C	
Portugal	C	
Roumania	C	
Uruguay	C	
Czecho-Slovakia	L	
Guatemala	L	
Liberia	L	
Brazil	P	
Poland	P	
Belgium	O	

TABLE OF MARKS—*continued.*

Country.	Nationality Mark.	Registration of Marks.
Peru	O	All communications made with P as first letter.
China	X	" " " C "
Honduras	X	" " " H "
Serbia-Croatia-Slavonia ..	X	" " " S "
Haiti	H	" " " H "
Siam	H	" " " S "
Ecuador	E	" " " E "
Greece	S	" " " G "
Panama	S	" " " P "
Hedjaz	A	" " " H "
Nicaragua.. .. .	A	" " " N "

REGISTRATION MARKS OF LICENSED CIVIL PASSENGER CARRYING MACHINES EQUIPPED WITH R/T.

Handley Page.	Daimler.
W/8b GEBBI	DH34 GEBCX
W/8b GEBBG	DH34 GEBBY
W/8b GEBBH	
0-400 GEATH	

Instone.

DH34	GEBBR
DH34	GEBBT
DH34	GEBBV
DH34	GEBBW
Vimy	GEASI
Vulcan	GEBBL

See Alphabetical List of Call Signs for Aircraft on page 583

SCIENTIFIC SIGNALS

HYDROGRAPHIC, METEOROLOGICAL, TIME AND GENERAL SIGNALS

- (1) Meteorological
- (2) Time
- (3) Hydrographic
- (4) General

SCIENTIFIC SIGNAL SECTION

INTRODUCTION

The detailed information set out in this Section will be found under following headings :—

(1) METEOROLOGICAL SECTION :

- (a) The International Code, French Meteorological Code, Lindenberg Code (for Upper Air Reports), American Code
- (b) Tabulated particulars of the different issues under Countries

(2) TIME SIGNAL SECTION :

- (a) Explanation and notes on the Rhythmic or Vernier Time Signals
- (b) Time Signal Codes in Chart Form
- (c) Tabulated particulars of the different issues under Countries

(3) HYDROGRAPHIC SECTION :

- (a) The International Safety Signal (Regulations)
- (b) Tabulated matter relating to Ice warnings and other Navigational warnings, under Countries

(4) GENERAL SECTION :

- (a) The Scientific Signals of the Union Radio-scientifique Internationale (U.R.S.I.), Radio Research Board Investigations of "Fading"
- (b) Calibrated Waves
- (c) Earthquake Information and Codes
- (d) Ship Distress Signals
- (e) Aviation Distress Signals
- (f) Fog Signals
- (g) Free Medical Advice to Seamen

In compiling this Section every effort has been made to give accurate and "up-to-date" details. This has only been possible by the assistance given by the Directors of the various Observatories and Services concerned, and the Editor wishes to take this opportunity of thanking all those who have complied with his request for information. In addition, the following publications have been consulted and acknowledgment is hereby made:—

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(1) METEOROLOGICAL SECTION.

The *INTERNATIONAL COMMISSION OF WEATHER TELEGRAPHY* is the body charged with the responsibility of devising the International Code for unifying the system of collecting and distributing meteorological information by wireless. The nature and also the extent of the present arrangements are set out in the pages which follow.

Meteorological information issued by W/T. comes within one or more of these headings:—

(a) *A Weather Report*, which is a statement of the present or existing weather conditions. This report may be (1) for a single station only, or (2), as is generally the case, it covers a comparatively large area (*i.e.*, a whole country or continent), and comprises weather data such as surface observations, "upper-air" temperatures and humidities collected by land-line and wireless from different sub-stations and sent to the Central Meteorological Observatory. In the latter case, the message is known as a "Synoptic Data Message." When the information contained therein is decoded, which may easily be done with the help of the Code tables given below, and the data plotted on a chart, which is called a Synoptic Chart, a forecast can be made of the weather in the locality covered by the Chart.

(b) *A Weather Forecast*, which is an opinion of future weather conditions issued by a Central Meteorological Observatory in possession of the information to be obtained from a Synoptic Chart.

(c) *A Storm Warning*, which is only broadcast when weather conditions are abnormal and shipping or aviation is thereby endangered.

Since the last edition of *THE YEAR BOOK* appeared, many important countries (from a meteorological point of view) have adopted the International Code, either in its entirety or with slight modification for national use.

A.—METEOROLOGICAL SECTION.

ABBREVIATIONS.

The following abbreviations are used throughout the section:—

- bar = barometer or barometric.
- (c) = Coastal station.
- °C = degrees centigrade.
- cw = continuous wave.
- F = Forecast.
- °F = degrees Fahrenheit.
- G.M.T. = Greenwich Mean Time.
- I = Ice report.
- (L) = Inland station.
- L.T. = local time.
- m = metres.
- mb = millibar(s).
- mm = millimetres.
- mod = modified.
- m.s.l. = mean sea level.
- N = Navigation warning.
- N.I.C. = New International Code.
- O = Ship observations from ships at sea.
- ob = observation(s) or observatory.
- O.I.C. = Old International Code.
- p.l. = plain language.
- R/T = Radio-telephony.
- S = surface observations.
- sp. = spark.
- temp. = temperature.
- T.S. = Time Signal.
- U.A.T. = Upper air temperature observations.
- U.W. = Upper air wind observations.
- U.R.S.I. = Union Radioscopique Internationale.
- W. = Storm warning.
- W.R. = Weather report.
- [] Signifies that word(s) or figure(s) printed within these brackets vary according to the time of message.
- “ ” Signifies that letters or figures contained within inverted commas are sent exactly as printed and are not coded.
- * An asterisk inserted after the time of a message indicates that the message follows either a Time Signal or a Weather Report.

CODES

THE (NEW) INTERNATIONAL CODE

I.—THE SYMBOLS AND THEIR MEANINGS.

- A = Form of *predominating cloud lowest* in the scale of cloud forms. (*see* Code VI):
- a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists (*see* Code VI).
- BBB = Pressure in millibars and tenths (initial 9 or 10 omitted), or millimetres and tenths (initial 7 omitted). The values refer to sea level and include all corrections for index error, temperature and gravity.
- BB = Pressure in whole millibars or whole millimetres (initial 9, 10 or 7 omitted). (For upper air reports of pressure, temperature and humidity, BB is in whole millibars with the hundreds figure omitted, whether this is 9, 8, 7, 6, or 5.)

B₁B₁B₁ = Pressure in whole millibars at an "inversion of temperature" in upper air reports.

b = Amount of barometric tendency during the three hours preceding the time of observation expressed in half-millibars or half-millimetres. For tendencies 10-19 the *second* figure only is reported and 33 is added to the wind direction number (DD). For tendencies greater than 29 the *second* figure only is reported and 67 added to the wind direction number. Tendencies greater than 29 are reported as 29.

bb = Amount of barometric tendency during the three hours preceding the time of observation expressed in half millibars or half millimetres.

C = Form of predominating cloud, according to the scale of cloud forms, when only one form is reported, as from ships at sea (*see* Code VI).

C₁ = Form of cloud observed by nephoscope; usually one of the two highest layers present (*see* Code VI).

Ca = Form of low cloud observed by nephoscope in reports for aviation (*see* Code VI).

c = Characteristic of barometric tendency during the period of 3 hours preceding the time of observation (*see* Code II).

DD = Direction of the wind near the ground on the scale (01-32) in which 08 = East, 16 = South, etc., 00 = calm.

dd = Direction of wind in the upper air, or of cloud movement, on the scale (01-36), *i.e.*, degrees from North divided by 10 and rounded off to the nearest whole number (00 = calm).

d = Direction from which swell comes on scale (0-8), in which 2 = East, 4 = South, etc., 0 = no swell.

ds = Direction of movement of ship on scale (0-8), in which 2 = Eastwards, 4 = Southwards, etc.

F = Force of the wind on the Beaufort Scale. (Forces above 9 are reported as 9 in telegrams, with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as "Storm ten," force 11 as "Storm eleven." Ships at sea, however, report "gale ten," "storm eleven," "hurricane twelve.")

F₁ = Approximate speed of low cloud (*see* Code XIV).

GG = Greenwich Time of observation (01 = 1 a.m., 12 = noon, 13 = 1 p.m., 24 = midnight).

H = Relative humidity of the air (*see* Code V).

h = Height of base of lowest cloud present (*see* Code VII).

H₁ = Heights at which upper air temperature and humidity are reported (no code figure telegraphed) (*see* Code XII).

h₁ = Height at which upper wind is reported (*see* Code XI).

I_nI_n = Index number of station.

jj = Meaning varies according to time of observation and between inland and coastal stations, as follows:—

	Inland Stations.	Coastal Stations.
--	---------------------	----------------------

At 0700 G.M.T.	- - jj = mm	jj = SV _s
At 1800 G.M.T.	- - jj = MM	jj = SV _s

K = The characteristic of the swell *in the open sea* (*see* Code IX (a)).

K' = Amount and characteristic of barometric tendency expressed by a single figure (*see* Code II (a)).

L = Amount of sky (scale 0-10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high) as A, if "a" refers to a different layer.

L.L.L = Latitude in degrees and tenths, the tenths being obtained by dividing the number of minutes by 6 and neglecting the remainder.

- lll = Longitude in degrees and tenths, the tenths being obtained as for latitude LLL.
- MM = Maximum temperature in the interval of 11 hours ending at 18 h. G.M.T. (or at one of the hours 1 h., 7 h., 13 h., 18 h. G.M.T., following not less than 4 hours after noon, local time).
- mm = Minimum temperature in the interval of 13 hours ending at 7 h. G.M.T. (or at the hour 13 hours after the time of reporting the maximum temperature).
- N = Total amount of sky covered with cloud (scale 0-10).
- P = Day of the week. 1 = Sunday, 2 = Monday, 3 = Tuesday, 4 = Wednesday, 5 = Thursday, 6 = Friday, 7 = Saturday. The day refers to G.M.T. and not to local time, *e.g.*, Sunday means the period from 0 h. to 24 h. on Sunday at Greenwich.
- Q = Quarter of globe in which ship is situated (*see* Code XIII).
- RR = Rainfall [at 7 a.m. for preceding 13 hours and at 6 p.m. for preceding 11 hours (*see* Code VIII)].
- R = Amount of rainfall for the preceding 24 hours (*see* Code VIII (a)).
- r = Time of commencement of precipitation (*see* Code X).
- S = State of the sea and swell (coast stations) (*see* Code IX).
- TT = Temperature of the air in whole degrees Fahrenheit or Centigrade (50 added to negative values).
- tt = Temperature of the sea (surface water) in whole degrees.
- TIT = Temperature of air in degrees and tenths Fahrenheit or Centigrade (500 added to negative values).
- ttt = Temperature of the sea (surface water) in degrees and tenths.
- t₁t₁ = Increase in temperature at an "inversion" in whole degrees.
- V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night) (*see* Code IV).
- v = Visibility at sea from ships at sea (*see* Code IV (a)).
- V_s = Visibility towards the sea (from coast stations) (*see* Code IV).
- VV = The relative speed of clouds as determined by nephoscope and such that the actual speed of the cloud will be given in kilometres per hour by the equation $vv = \frac{h}{1000} \times VV$, if "h," the height of the cloud, is expressed in metres. This unit is the "radian per hour."
- vv = The speed of the wind in the upper air in kilometres per hour or miles per hour (for values greater than 99 the last two figures only are used and 50 is added to the number indicating wind direction dd).
- W = The weather in the interval since the preceding time of report. This interval is 5, 6 or 7 hours for stations reporting 4 times daily. (For special reports for aviation it is 1 hour or 2 hours) (*see* Code III).
- ww = The actual weather at the time of observation with which is combined, whenever possible, the general character of the weather (*see* Code I).
- w₁ = The initial figure of the code ww, thus indicating the general state of the weather.
- x₁ = A check figure obtained by adding the first four figures of the group and taking the units figure in the sum so obtained.
- x₂, x₃, x₄, x₅ = Check figures obtained in a similar manner.
- y₁ = A check figure obtained by adding together the first figure of each of the preceding groups, thus : Q + P + B + F + w, and taking the units figure of the sum.
- y₂, y₃, y₄ = Check figures obtained in a similar way from the 2nd, 3rd and 4th figures respectively.
- z = Key figure obtained by adding together all the x's or all the y's.

II.—SYMBOLIC FORM OF MESSAGES.

(1) REPORTS FROM LAND STATIONS.

(a) The form for observations at 0100 and 1300 G.M.T. is—

BBBDD FwwTT cbWVH ALaNh C₁ddVV,

and for observations at 0700 and 1800 G.M.T.—

BBBDD FwwTT cbWVH ALaNh RRjjr C₁ddVV,

where jj in the fifth group is replaced, as follows:—

	Inland Stations.	Coastal Stations.
at 0700 G.M.T.	mm	SV _s
at 1800 G.M.T.	MM	SV _s

The group C₁ddVV, containing cloud observations by nephoscope, is omitted entirely* if no such observations are available.

(b) *Upper Winds* are reported by groups of the form h₁ddvv, one group being used for each height.

(c) *Upper Air Temperatures and Humidities* are reported by groups of the form BBTTH.

In this case no figure is telegraphed to indicate the height, it being understood that the groups refer to the heights of the code H₁ in order.

Inversions are reported at the end by groups 00000 B₁B₁B₁t₁t₁, the first being an index group indicating that an inversion is reported, while B₁B₁B₁ is the pressure in whole millibars at the height of the inversion, and t₁t₁ the increase of temperature in whole degrees.

(d) In *Collective Messages* the observations of *each* station are preceded by a group consisting of the index number of the station (usually two figures) by which it is identified. The messages are arranged in sections, the first containing the ordinary observations from *all* stations, the second, preceded by the word "Pilot" or an equivalent, containing all reports of upper wind and the third, preceded by "Temp" or an equivalent, containing all observations of upper air temperature.

Any other observations, such as those from ships, form a fourth section.

The symbolic form of a complete message, embracing surface observations at 0700 or 1800 G.M.T., upper winds and upper air temperatures and humidities, would be as follows, where the observations contained in the groups in each line, refer to the stations indicated by the index figures, I₁I₁, I₂I₂, etc., preceding them.

	I ₁ I ₁	BBBDD	FwwTT	cbWVH	ALaNh	RRjjr (C ₁ ddVV)
	I ₂ I ₂	BBBDD	FwwTT	cbWVH	ALaNh	RRjjr (C ₁ ddVV)
	I ₃ I ₃	BBBDD, etc.,				
	etc.					
	etc.					
Pilot	I ₁ I ₁	h ₁ ddvv	h ₁ ddvv	h ₁ ddvv.		
	I ₂ I ₂	h ₁ ddvv	h ₁ ddvv	h ₁ ddvv.		
	I ₃ I ₃	h ₁ ddvv, etc.				
	etc.					
	etc.					
Temp.	I ₁ I ₁	BBTTH	BBTTH, etc.			00000
		B ₁ B ₁ B ₁ t ₁ t ₁ , etc.				
	I ₂ I ₂	BBTTH	BBTTH, etc.			00000
		B ₁ B ₁ B ₁ t ₁ t ₁ , etc.				
	I ₃ I ₃	BBTTH, etc.,				
	etc.					
	etc.					

For observations at other hours the form would be the same, except that the group RRjjr would not be included.

* The general rule in reports of all kinds is, however, that missing figures shall be replaced by hyphens (one for each figure).

(2) REPORTS FROM SHIPS AT SEA.

These are in the form:—

QLLL_{x₁} Plll_{x₂} BBDD_{x₃} FvKdx₄ wwGG_{x₅} y₁y₂y₃y₄z
 {CNTTd_s WrttK' (if temperature on Fah. scale).
 {CNTTT Wrttt (if temperature on C. scale).

An alternative form for use without check figures is:—

PQLLL lllGG BBDDF wwvKd.
 {CNTTd_s WrttK' (if temperature on Fah. scale).
 {CNTTT Wrttt (if temperature on C. scale).

(Both these forms are operative at present, but a decision between the two forms is to be made by the Permanent International Meteorological Committee after consultation of the different services affected.)

(3) HOURLY REPORTS FOR AVIATION AND OTHER SPECIAL PURPOSES.

(a) The normal form for hourly reports is:—

I_nI_n(V_s) wwVhL NDDFW

with the addition, every three hours, of a group—

C_addF₁S,

where C_a is the type of cloud to which ddF₁ refer.

(b) If fuller information is required, then every three or six hours the form is—

I_nI_n(V_s) BBBDD FwwTT cbWVH ALaNh (C_addF₁S).

NOTE.—When, for any reason, V_s is not available, *nō* hyphen is inserted in its place. If none of the information in the group C_addF₁S is available the whole group is omitted. In all other cases hyphens are used, in the normal way, to denote lack of information.

(4) ABBREVIATED REPORTS FOR COLLECTIVE MESSAGES COVERING A WHOLE CONTINENT.

The form of report for each station is:—

BBDDF w₁TTK'R for observations at 0700 G.M.T.;

BBDDF w₁TTK'W for observations at other hours.

(5) SPECIAL FORM FOR REPORTS FROM ICELAND AND THE FAEROES.

(i) *Observations at 0100 and 0700 G.M.T. reported together:—*

Thorshavn and Reykjavik:

BBcbb BBBDD FwwTT cbWVH ALaNh RRSV_{sr} (C₁ddVV).

Other stations:

BBcbb BBBDD FwwTT cbWAN, where the first group in each case refers to 0100 G.M.T.

(ii) *Observations at 1300 and 1800 G.M.T.:—*

Thorshavn and Reykjavik:

1300:—BBBDD FwwTT cbWVH ALaNh (C₁ddVV).

1800:—BBBDD FwwTT cbWVH ALaNh RRSV_{sr} (C₁ddVV).

Other stations:

1300 and 1800:—BBBDD FwwTT cbWAN.

III.—SPECIFICATION OF THE SCALES.

CODE I.

Weather at actual time of observation and general character of weather (ww).

NOTES.—(i) In interpreting reports it is to be noted that, as a rule, the largest number in the scale which is appropriate to the weather is reported.

(ii) In selecting the number for ww no account is to be taken of phenomena which occurred more than one hour before the time of observation, but only of phenomena which occurred during the interval of one hour preceding the fixed hour of observation.

(iii) Numbers 20-29 are not to be used unless visibility is less than 2 kilometres or 1 nautical mile.

		Code figures.
<i>Fine or Fair</i> (Cloud 0-5)	Cloud has decreased	00
	No apparent change	01
	Cloud has increased	02
	Precipitation within sight	03
	With solar or lunar halo	04
	After fog or mist (or dust storm)	05
	After rain or drizzle	06
	After snow, sleet or hail	07
	With or after thunder and lightning in neighbourhood	08
	After thunderstorm	09
<i>Cloudy or Overcast</i> (Cloud 6-10)	Cloud has decreased	10
	No apparent change	11
	Cloud has increased	12
	Precipitation within sight	13
	With solar or lunar halo	14
	After fog or mist (or dust storm)	15
	After rain or drizzle	16
	After snow, sleet or hail	17
	With or after thunder and lightning in neighbourhood	18
	After thunderstorm	19
<i>Fog or Mist</i>	Fog or mist but clear in zenith	just 20
	.. .. . and apparently overcast	begun 21
	.. .. . but clear in zenith	inter- 22
	.. .. . and apparently overcast	mittent 23
	.. .. . but clear in zenith	for some 24
	.. .. . and apparently overcast	time. Has 25
	.. .. . become thinner.	
	Fog or mist but clear in zenith	for some 26
	.. .. . and apparently overcast	- time. 27
	.. .. . but clear in zenith	for some 28
<i>Fog or Mist</i>	.. .. . and apparently overcast	time. Has 29
	.. .. . become thicker.	
	Slight with rain	30
	.. .. . hail or rain and hail	31
	.. .. . sleet	32
	.. .. . snow	33
<i>Passing Showers.</i>	Heavy with rain ; has become better	34
	.. .. . rain	35
	.. .. . rain ; has become worse	36
	.. .. . hail or rain and hail	37
	.. .. . sleet	38
	.. .. . snow	39
	Slight occasional	40
	.. .. . continuous	41
	.. .. . but has increased	42
	Moderate but has decreased	43
<i>Drizzle</i>	.. .. . occasional	44
	.. .. . continuous	45
	.. .. . but has increased	46
	Thick but has decreased	47
	.. .. . occasional	48
	.. .. . continuous	49



III.—SPECIFICATION OF THE SCALES—*continued.*

CODE I—*continued.*

								Code figures.
Rain	{	Slight	occasional	..	..	..	..	50
		"	continuous	..	..	..	..	51
		"	but has increased	..	..	..	..	52
		Moderate	but has decreased	..	..	..	..	53
		"	occasional	..	..	..	..	54
		"	continuous	..	..	..	..	55
		"	but has increased	..	..	..	..	56
		Heavy	but has decreased	..	..	..	..	57
		"	occasional	..	..	..	..	58
"	continuous	..	..	..	..	59		
Snow or Snow and Hail.	{	Slight	occasional	..	..	..	..	60
		"	continuous	..	..	..	..	61
		"	but has increased	..	..	..	..	62
		Moderate	but has decreased	..	..	..	..	63
		"	occasional	..	..	..	..	64
		"	continuous	..	..	..	..	65
		"	but has increased	..	..	..	..	66
		Heavy	but has decreased	..	..	..	..	67
		"	occasional	..	..	..	..	68
"	continuous	..	..	..	..	69		
Sleet or Rain and Snow	{	Slight	occasional	..	..	..	..	70
		"	continuous	..	..	..	..	71
		"	but has increased	..	..	..	..	72
		Moderate	but has decreased	..	..	..	..	73
		"	occasional	..	..	..	..	74
		"	continuous	..	..	..	..	75
		"	but has increased	..	..	..	..	76
		Heavy	but has decreased	..	..	..	..	77
		"	occasional	..	..	..	..	78
"	continuous	..	..	..	..	79		
Hail or Rain and Hail.	{	Slight	occasional	..	..	..	..	80
		"	continuous	..	..	..	..	81
		"	but has increased	..	..	..	..	82
		Moderate	but has decreased	..	..	..	..	83
		"	occasional	..	..	..	..	84
		"	continuous	..	..	..	..	85
		"	but has increased	..	..	..	..	86
		Heavy	but has decreased	..	..	..	..	87
		"	occasional	..	..	..	..	88
"	continuous	..	..	..	..	89		
Thunderstorm (or Line squall)	{	Slight	thunderstorm	without hail	..	..	..	90
		"	"	with hail	..	..	..	91
		Moderate	thunderstorm	without hail	..	..	..	92
		"	"	with hail	..	..	..	93
		Heavy	thunderstorm	without hail	{	without	94	
		"	"	with hail		gale	95	
		"	"	without hail		with	96	
		"	"	with hail		gale	97	
		Line squall	without hail	..	..	..	..	98
		"	"	with hail	..	..	..	99


SYMBOLIC VERSION OF ABOVE CODE (FOR SYNOPTIC CHARTS).

Present Weather Code (ww).

First fig. }	0	1	2	3	4	5	6	7	8	9	
Second figure: }	0	bc—	bc	bc+	bcv	bc⊕	bc/f	bc/r	bc/s	bcil	bc/tl
	1	co—	co	co+	cov	co	co/f	co/r	co/s	cotl	co/tlc
	2	fb	fo	ifb	ifo	fb—	fo—	ffb	ffo	fb+	fo+
	3	pr _o	ph _o	prs _o	ps _o	PR—	PR	PR+	PH	PRS	PS
	4	d _o	d _o d _o	d _o +	d—	d	dd	d+	D—	D	DD
	5	r _o	r _o r _o	r _o +	r—	r	rr	r+	R—	R	RR
	6	s _o	s _o s _o	s _o +	s—	s	ss	s+	S—	S	SS
	7	rs _o	rs _o rs _o	rs _o +	rs—	rs	rsrs	rs+	RS—	RS	RSRS
	8	h _o (r _o)	rh _o rh _o	h _o (r _o)+	h(r)—	h(r)	rhrh	h(r)+	H(R)—	H(R)	RHRH
	9	tlr _o	tlrh _o	tlr	tlrh	TLR	TLRH	TLR 	TLRH 	KQ	KQH

A solidus (/) such as occurs in the combination "bc/r," separates weather at the time of observation from the preceding weather, bc/r thus indicates "fine or fair after rain or drizzle."

The letters have the following meanings:—

- b = fine (blue sky; not more than $\frac{1}{4}$ sky covered).
- bc = fair sky partly cloudy, $\frac{1}{2}$ covered).
- c = cloudy (sky $\frac{3}{4}$ covered).
- d = drizzle.
- f = fog.
- h = hail.
- i = intermittent (occasional).
- j = adjacent (*i.e.*, in vicinity of station).
- KQ = line squall.
- l = lightning.
- o = overcast.
- p = passing showers.
- r = rain.
- s = snow.
- t = thunder.
- tlr = thunderstorm.
- ⊕ = halo.
-  = gale.

The following additional letters are sometimes used in maps:—

- e = wet air without rain falling (a copious deposit of water on trees, buildings or rigging).
- g = gloomy.
- m = mist.
- q = squally.
- u = ugly, threatening.
- v = extreme visibility (the horizon or distant hills unusually clear).
- w = dew.
- x = hoar frost.
- y = dry air (humidity below 60 per cent.).
- z = haze (dust haze, the turbid atmosphere of dry weather).

CODE II.

Characteristic of Barometric Tendency during the three hours preceding the time of observation (c).

Code figure.			
0 = 0 or +	..	Steady or rising	} The barometer is now higher than or the same as three hours ago.
1 = + 0	..	Rising then steady	
2 = + —	..	Rising then falling	
3 = — + or 0 +	..	Falling or steady then rising	
4 = unsteady +	..	Unsteady but rising	} The barometer is now lower than three hours ago.
5 = —	..	Falling	
6 = — 0	..	Falling then steady	
7 = — +	..	Falling then rising	
8 = 0 — or + —	..	Steady or rising then falling	
9 = unsteady —	..	Unsteady but falling	

CODE II (a).

Amount and characteristic of Barometric Tendency expressed by a single figure (K').

Code figure.		Change in last three hours in half-millibars.
0	Barometer steady	0 or 1
1	Barometer rising slowly	2 or 3
2	Barometer rising	4 to 7
3	Barometer rising quickly	8 to 12
4	Barometer rising very rapidly	more than 12
5	Barometer falling slowly	2 or 3
6	Barometer falling	4 to 7
7	Barometer falling quickly	8 to 12
8	Barometer falling very rapidly	more than 12

CODE III.

Past Weather in interval since last report (W).

	Code figure	
Without precipitation.	{ 0 —	Fair or fine
	{ 1 —	Cloudy
	{ 2 —	Overcast continuously
	{ 3 —	Fog or mist
	{ 4 —	Thick fog
Precipitation.	{ 5 —	Passing showers
	{ 6 —	Rain or drizzle
	{ 7 —	Snow or sleet
	{ 8 —	Hail or rain and hail
	{ 9 —	Thunderstorm

CODE IV.

*Horizontal Visibility (V) and (V_s).*Code
figure.

- 0 = Objects not visible at 50 metres (55 yards).
 1 = Objects not visible at 200 metres (220 yards).
 2 = Objects not visible at 500 metres (550 yards).
 3 = Objects not visible at 1,000 metres (1,100 yards).
 4 = Objects not visible at 2,000 metres (1 $\frac{1}{4}$ miles).
 5 = Objects not visible at 4,000 metres (2 $\frac{1}{2}$ miles).
 6 = Objects not visible at 10,000 metres (6 $\frac{1}{4}$ miles).
 7 = Objects not visible at 20,000 metres (12 $\frac{1}{2}$ miles).
 8 = Objects not visible at 50,000 metres (31 $\frac{1}{4}$ miles).
 9 = Objects visible at 50,000 metres or more.

CODE IV (a).

*Horizontal Visibility from Ships at Sea (v).*Code
figure.

- 0 = Dense fog, objects not visible at 50 yards.
 1 = Thick fog, objects not visible at 1 cable.
 2 = Fog, objects not visible at 2 cables.
 3 = Moderate fog, objects not visible at $\frac{1}{2}$ mile (nautical).
 4 = Thin fog or mist, objects not visible at 1 mile (nautical).
 5 = Visibility poor, objects not visible at 2 miles (nautical).
 6 = Visibility moderate, objects not visible at 5 miles (nautical).
 7 = Visibility good, objects not visible at 10 miles (nautical).
 8 = Visibility very good, objects not visible at 30 miles (nautical).
 9 = Visibility excellent, objects visible more than 30 miles (nautical).

CODE V.

Relative Humidity (H).

Code figure.

0	..	..	..	..	95 to 100 per cent.
9	..	..	..	..	90 to 94 per cent.
8	..	..	..	..	80 to 89 per cent.
7	..	..	..	..	70 to 79 per cent.
6	..	..	..	..	60 to 69 per cent.
5	..	..	..	..	50 to 59 per cent.
4	..	..	..	..	40 to 49 per cent.
3	..	..	..	..	30 to 39 per cent.
2	..	..	..	..	20 to 29 per cent.
1	..	..	..	..	10 to 19 per cent.

CODE VI.

Cloud Form (A, a, C, C₁ Ca).

Code figure.

1	..	Cirrus	..	..	..	..	Ci.
2	..	Cirro-Stratus	..	..	..	..	Ci. St.
3	..	Cirro-Cumulus	..	..	..	..	Ci. Cu.
4	..	Alto-Cumulus	..	..	..	..	A. Cu.
5	..	Alto-Stratus	..	..	..	..	A. St.
6	..	Strato-Cumulus	..	..	..	..	St. Cu.
7	..	Nimbus	..	..	..	..	Nb.
8	..	Cumulus or Fracto-Cumulus	..	..	..	..	Cu. or Fr. Cu.
9	..	Cumulo-Nimbus	..	..	..	..	Cu. Nb.
0	..	Stratus or Fracto-Stratus	..	..	..	..	St. or Fr. St.

CODE VII.

Height of Base of Lowest Cloud present (h).

Code figure.	Metres.	Feet.
0	0 to 50	0 to 150
1	50 to 100	150 to 300
2	100 to 200	300 to 600
3	200 to 300	600 to 1000
4	300 to 600	1000 to 2000
5	600 to 1000	2000 to 3000
6	1000 to 1500	3000 to 5000
7	1500 to 2000	5000 to 6500
8	2000 to 2500	6500 to 8000
9	No low cloud	No low cloud

CODE VIII.

Amount of Rainfall (RR).

This is expressed in whole millimetres with the following exceptions:—
Specification of certain meanings.

Code figure.	Meaning.
91	0.1 mm.
92	0.2 mm.
93	0.3 mm.
94	0.4 mm.
95	0.5 mm.
96	0.6 mm.
97	Some rain but not measurable.
98	More than 90 mm.
99	Measurement impossible or unreliable.

CODE VIII (a).

Amount of Rainfall during preceding 24 hours (R).

Code figure.	
0	No rain.
1	Trace or 0.1 mm.
2	0.2 to 2 mm.
3	3 to 5 mm.
4	6 to 10 mm.
5	11 to 15 mm.
6	16 to 20 mm.
7	21 to 30 mm.
8	31 to 50 mm.
9	above 50 mm.

CODE IX.

State of Sea and Swell (S).

Code figure.	
0	No swell
1	Moderate swell
2	Heavy swell
3	No swell
4	Moderate swell
5	Heavy swell
6	Rather rough sea.
7	Rough sea.
8	Very rough sea.
9	Mountainous sea.

Calm or slight sea.

Moderate sea.

CODE IX (a).

Characteristic of Swell in the Open Sea (K).

Code figure.

0	No or slight swell	} and sea smooth to moderate.
1	..	..	..	..	Moderate swell
2	..	..	..	..	Heavy swell
3	..	..	..	..	Long low swell
4	Confused swell	} and sea rough.
5	..	..	..	..	No or slight swell
6	..	..	..	..	Moderate swell
7	..	..	..	..	Heavy swell
8	..	..	..	..	Long low swell
9	..	..	..	..	Confused swell

CODE X.

Time of Commencement of Precipitation (r).

Code figure.

0	..	..	..	..	No rain.
1	..	..	..	..	0 to 1 hour before time of observation.
2	..	..	..	..	1 to 2 hours before time of observation.
3	..	..	..	..	2 to 3 hours before time of observation.
4	..	..	..	..	3 to 4 hours before time of observation.
5	..	..	..	..	4 to 5 hours before time of observation.
6	..	..	..	..	5 to 6 hours before time of observation.
7	..	..	..	..	6 to 8 hours before time of observation.
8	..	..	..	..	8 to 10 hours before time of observation.
9	..	..	..	..	above 10 hours before time of observation.
-	..	..	..	..	No observation.

CODE XI.

Height at which Upper Wind is reported (h_1).

The heights at which the upper wind is reported are the *three* heights selected from the following list which give the best representation of the result of the pilot-balloon ascent.

Code figure.	metres.	feet (used in British reports).
1	200	or 1,000
2	500	or 2,000
3	1,000	or 3,000
4	1,500	or 5,000
5	2,000	or 7,000
6	3,000	or 10,000
7	4,000	or 13,000
8	5,000	or 16,000
9	6,000	or 20,000

CODE XII.

Heights at which Upper Air Temperature and Humidity are reported (H_1)
(no code figure telegraphed).

200 metres	} above ground.
500 metres	
1,000 metres	} above mean sea level.
1,500 metres	
2,000 metres	
2,500 metres	
3,000 metres	
4,000 metres	
5,000 metres	
6,000 metres	

CODE XIII.

Quarter of Globe (Q).

Code figure.	Latitude.	Longitude.	
1	N.	W.	} Barometer in millibars.
2	N.	E.	
3	S.	W.	
4	S.	E.	
5	N.	W.	} Barometer in millimetres.
6	N.	E.	
7	S.	W.	
8	S.	E.	

CODE XIV.

Approximate Speed of Low Cloud (F_1).

Code figure.	Corresponding Mean Speed.		Limits of Speed.	
	If in km. per hour.	If in miles per hour.	If in km. per hour.	If in miles per hour.
0	Less than 5	Less than 5	0-7	0-4
1	15	10	8-22	5-14
2	30	20	23-37	15-24
3	45	30	38-52	25-34
4	60	40	53-67	35-44
5	75	50	68-82	45-54
6	90	60	83-97	55-64
7	105	70	98-112	65-74
8	120	80	113-127	75-84
9	135	90	128-142	85-94

THE OLD INTERNATIONAL CODE.

I.—THE SYMBOLS AND THEIR MEANINGS.

BBB is the corrected barometric pressure in tenths of mm. (the first figure 7 is omitted).

DD is direction of the wind (true not magnetic) on scale (01-32), where 02 = NNE, 04 = NE, etc., 32 = N., 00 = calm.

F is strength of the wind on Beaufort Scale (0-12) (for numbers above 9, the figure 9 is reported and actual force given in words at end).

W is state of the sky (*see* Code I, below).

TT is temperature in whole degrees Centigrade. 50 is added to the number when the temperature is below zero.

C is direction of motion of upper-clouds (*see* Code II, p. below).

β is characteristic of barometric tendency (*see* Code III, p. below).

bb is the amount of the tendency in tenths of mm.; 50 is added to the wind direction number (DD) if the tendency is negative.

RR is rainfall in mm., in past 24 hours (*see* Code VI, p. below, for special meanings).

MM is maximum temperature	{	From 7 h. of the preceding day
mm is minimum temperature		to 7 h. of the day of observation.
		These are in whole degrees Centigrade, 50 being added if the temperature is below zero.

u is sea disturbance (*see* Code IV, p. below).

W' is characteristic of past weather sent at the end of the second group in place of C in 18 h. messages (*see* Code V, p. below).

(I_NI_N is the index number of the reporting station.)

II.—SYMBOLIC FORM OF MESSAGES.

Observations at 1800 G.M.T.—BBBDD FWTTW'.

Observations at 0700 G.M.T.—BBBDD FWTTC β bbRR MMmmu.

III.—SPECIFICATION OF THE SCALES.

CODE I.

State of the Sky (W).

Code figure.

- 0 Sky cloudless.
- 1 Sky $\frac{1}{4}$ covered.
- 2 Sky $\frac{1}{2}$ covered.
- 3 Sky $\frac{3}{4}$ covered.
- 4 Sky overcast.

Code figure.

- 5 Rain.
- 6 Snow
- 7 Mist.
- 8 Fog.
- 9 Thunderstorm.

CODE II.

Direction of Upper (Cirro-) Cloud (C).

Code figure.

- 0 Clouds with no appreciable movement.
- 1 Clouds from N.E.
- 2 Clouds from E.
- 3 Clouds from S.E.
- 4 Clouds from S.

Code figure.

- 5 Clouds from S.W.
- 6 Clouds from W.
- 7 Clouds from N.W.
- 8 Clouds from N.
- 9 No observation.

CODE III.

Characteristic of Tendency (β).

Figures characterising the change of pressure during the 3 hours preceding the observation.

Code figure.

- 0 Barometer steady.
- 1 Barometer unsteady.
- 2 Barometer rising.
- 3 Barometer falling.
- 4 Barometer falling then rising.
- 5 Barometer steady then rising.

Code figure.

- 6 Barometer steady then falling.
- 7 Barometer falling then steady.
- 8 Barometer rising then steady or falling.
- 9 Line squall.

CODE IV.

Sea Disturbance (u).

Code figure.

- 0 Sea calm.
- 1 Sea very smooth.
- 2 Sea smooth.
- 3 Sea slight.
- 4 Sea moderate.

Code figure.

- 5 Sea rather rough.
- 6 Sea rough.
- 7 Sea high.
- 8 Sea very high.
- 9 Sea phenomenal.

CODE V.

Characteristic of past Weather (W').

Code figure.

- 0 Mainly fine.
- 1 Fair (high clouds preponderating).
- 2 Mainly overcast (low clouds preponderating).
- 3 Sheet lightning (more than one flash).
- 4 Precipitation, mainly during forenoon, without thunderstorms or with at most one peal of thunder without lightning.
- 5 Precipitation, mainly during afternoon, without thunderstorms or with at most one peal of thunder without lightning.
- 6 Mainly foggy.
- 7 Thunderstorm.
- 8 Passing showers (squally, changeable weather with bright intervals).
- 9 Persistent precipitation (including falls of snow or soft hail of long duration, sky overcast during the intervals).

CODE VI.

Rainfall (RR).

The following code figures are used with a special significance :
Code figures.

- 00 No precipitation.
 - 99 Precipitation has occurred, but its amount has not been measured.
 - 98 Precipitation exceeding 96 mm.
 - 97 "Trace" of precipitation, amount less than 0.5 mm.
- Amounts exceeding 96 mm. are reported in full at the end of the message, the figures 98 being inserted in the coded part.

UNITS EMPLOYED BY EACH COUNTRY FOR REPORTS OF
PRESSURE, TEMPERATURE AND UPPER WIND SPEED.

Country.	Surface. Pressure.	Surface. Temperature.	Speed of Upper Wind.
<i>Europe—</i>			
Great Britain	mb.*	° F.*	m.p.h.
Austria	mm.	° C.	m./s.
Belgium	mm.	° C.	km./h.
Bulgaria	mm.	° C.	
Czechoslovakia	mm.	° C.	km./h.
Denmark	mm.	° C.	
Estonia	mm.	° C.*	
Finland	mm.	° C.	m./s.
France	mm.	° C.	km./h.
Germany	mm.	° C.*	m./s.
Gibraltar	mb.	° F.	
Greece	mm.	° C.	
Holland	mm.	° C.	km./h.
Hungary	mm.*	° C.*	
Italy	mm.	° C.	2m./s.
Latvia	mm.	° C.	m./s.
Malta	mb.	° F.	m.p.h.
Norway	mb.	° C.	km./h.
Poland	mm.	° C.	m./s.
Portugal	mm.	° C.	
Roumania	mm.	° C.	km./h.
Russia	mm.	° C.	
Spain	mb.	° C.	m./s.
Sweden	mm.*	° C.*	m./s.
Turkey	mm.	° C.	km./h.
Jugo-Slavia	mm.	° C.	
<i>N. Africa and Syria.</i>			
Egypt	mb.	° C.	km./h.
Morocco, Algeria and Tunisia	mm.	° C.	km./h.
Syria	mm.	° C.	

Note (1).—mb. = millibar. m.p.h. = miles per hour.
mm. = millimetre. km./h. = kilometres per hour.
m./s. = metres per second.

* Same units employed for upper air temperature and pressure.

FRENCH METEOROLOGICAL CODE

In the synoptic messages transmitted according to the French Meteorological Code the letter-symbols employed have the same meaning as in the New International Meteorological Code with the undermentioned exceptions:—

- A_1 = Nature of clouds lower than 2,500 metres. (See Table A_1 .)
 A_2 = " " higher than 2,500 metres. (See Table A_2 .)
 bb = Barometric tendency. (See Table 6a.)
 DD = Direction of surface wind (0-32). (See Table 2.)
 dd = Direction of the lower clouds (0-32). (See Table 2.)
 d = Direction of upper clouds (Ci, Ci, Cu, Ci, Str). (See Table 2d.)
 ddf = Sondages: direction of wind (dd) and force (ff).
 The groups ddf are reported successively at altitudes of 500, 1,000, 1,500, 2,000, 3,000 and 4,000 metres.
 dd = Direction of the wind (0-32). (See Table 2.)
 ff = Force of the wind in kilometres per hour; (for forces exceeding 100 kilometres per hour, 50 is added to dd).
 N = Amount of cloudiness. (See Table N.)
 n = Amount of lower clouds (similar to N.)
 P = Present weather. (See Table P.)
 P₁ = Past weather. (Similar to P.)
 T₁T₁ = Difference between wet and dry bulb thermometer in tenths of a degree.
 w₁w₁ = Weather changes. (See Table w₁w₁.)

TABLES.

A_1 = Nature of clouds lower than 2,500 metres.

- 0—No low clouds.
- 1—Stratus and/or fracto-stratus.
- 2—Cumulus and/or fracto-cumulus.
- 3—Stratus and cumulus or stratus and strato-cumulus.
- 4—Strato-cumulus.
- 5—Nimbus and cumulus.
- 6—Cumulo-nimbus and cumulus.
- 7—Nimbus and cumulo-nimbus.
- 8—Cumulo-nimbus.
- 9—Nimbus.

A_2 = Nature of clouds higher than 2,500 metres.

- 0—No middle or high clouds.
 - 1—Cirrus only.
 - 2—Cirro-cumulus only or cirro-cumulus and cirrus.
 - 3—Cirro-stratus only or cirro-stratus and cirrus.
 - 4—Cirrus and alto-cumulus.
 - 5—Cirrus and alto-stratus.
 - 6—Cirrus and alto-cumulus and alto-stratus.
 - 7—Alto-cumulus only visible.
 - 8—Alto-cumulus and alto-stratus.
 - 9—Alto-stratus uniformly or only visible.
- (The term cirrus includes cirrus, cirro-stratus and cirro-cumulus, or any combination thereof.)

N = Total cloudiness.

- | | |
|--------------------------|---------------------------|
| 0—Clear sky. | 5—Sky covered, '7 or '8. |
| 1—Sky nearly clear. | 6—Sky covered, '9. |
| 2—Sky covered, '1 or '2. | 7—Sky nearly covered. |
| 3—Sky covered, '3 or '4. | 8—Sky entirely covered. |
| 4—Sky covered, '5 or '6. | 9—Observation impossible. |

P = Present weather, determining the state of the sky, partially given by N.

- 0—No dangerous weather.
- 1—Continual rain or drizzle.
- 2—Continual snow.
- 3—Showers of rain, or intermittent rain, or hail showers.

- 4—Snow showers.
- 5—Storm (with or without squalls).
- 6—Squalls (or line squall), or rain and hail, or heavy showers of rain.
- 7—Squalls, surface wind strong or upper wind light.
- 8—Thick fog or mist, visibility less than 1,000 metres.
- 9—Fog or mist, upper air clear.

(Where a double observation represents the state of the weather, the one which is of interest to aviators is given, or else that which denotes the exact state of the sky.)

w_1w_1 = WEATHER CHANGES.

w_1w_1	Present Weather.	Changes during preceding 6 hours.
00	Clear sky.	
01	Clear sky.	Alternately very cloudy (Cu-Nb, Fr-Cu, or Fr-Nb), and then clear with high and middle fragmentary clouds.
02	Clear sky, with thin detached Ci.	
03	Idem 02	Idem 01.
04	Clear sky, with Fr-St, Fr-Cu, or local detached Ci.	
05	Idem 04.	Idem 01.
06	Sky with Fr-St, Fr-Cu, or local detached Ci-Cu.	
07	Idem 06.	Idem 01.
08	Sky with local serrated Cu, almost Cu clouds gradually increasing flat, or St-Cu.	
09	Idem 08.	Idem 01.
10	Sky with, or without, local Ci-Cu, or veiled with Ci-St.	
11	Idem 10.	Clear sky, except for local detached Ci-Cu.
12	Completely covered with Ci-St (halo); local Cu absent, or being reabsorbed.	
13	Idem 12.	Idem 11.
14	Sky with, or without, local Ci-Cu and detached banks of high and middle clouds (A-Cu, A-St, or lenticular Ci-St) constantly changing.	
15	Idem 14.	Idem 11.
16	Serrated layer, more or less misty, with A-Cu.	A-Cu increasing with tendency to join.
17	Idem 16.	Idem 14.
18	Sky obscured by St.	
19	Sky obscured by fog or thick mist.	
20	Sky covered with A-St with detached low clouds; no rain.	
21	Idem 20.	Ci and A-Cu, or A-Cu only.
22	Idem 20.	Ci and A-Cu, with intermittent light rain.
23	Idem 20, with intermittent light rain.	Idem 21.

W₁W₁ = WEATHER CHANGES—*continued.*

24	Sky covered with veil of A-St and low clouds, no rain.	
25	Idem 24.	Ci with covering of Ci-St.
26	Idem 20.	Idem 26, with continuous or nearly continuous rain.
27	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous rain.	Idem 24.
28	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous snow.	
29	Sky covered with A-St, lining of low clouds ; continuous or nearly continuous snow.	Idem 24.
30	Sky cloudy, or very cloudy (large Fr-Cu or Fr-Nb), mist, high fragmentary clouds, no showers.	
31	Idem 30.	Sky covered with A-St ; rain or no rain.
32	Sky cloudy (large Fr-Cu or Fr-Nb) with intervals of sky.	
33	Idem 32.	Showers or squalls ; then fair.
34	Alternately showery and fair with very cloudy sky (Cu-Nb or Mm-Cu and upper and middle fragmentary clouds).	
35	Idem 34.	Idem 31.
36	Alternately, showers of snow, hail or sleet, then clear ; sky very cloudy (Cu-Nb or Mm-Cu and upper and middle fragmentary clouds).	
37	Idem 36.	Idem 31.
38	Alternately, heavy hail squalls, then clear ; sky very cloudy (Cu-Nb or Mm-Cu and high fragmentary clouds).	
39	Idem 38.	Idem 31.
40	Stormy ; cloudy to very cloudy ; low heavy striped Ci (Ci-Cu A-Cu, partially covered with Ci-St).	
41	Idem 40.	Clear sky ; except detached thin Cu.
42	Stormy sky filled with clouds at different altitudes (particular clouds indicating the presence of A-Cu—castellatus—Mm-Cu).	
43	Sky filled with clouds at different altitudes ; threatening ; (distant thunder with lightning on the horizon).	
44	Idem 42.	Very cloudy ; low heavy Ci, Ci-Cu, A-Cu, partially covered with Ci-St.
45	Sky stormy, or threatening.	
46	Idem 45.	Idem 44
47	Storm passed (St Cu or Mm-Cu with intervals of clear sky for 6 hours or more after a stormy sky).	
48	Idem 47.	Stormy sky.

Note.—When any change described above is preceded for 6 hours by fog, mist or St, the same will be indicated by the addition of 50 to the code number signalled.

TABLE 2.—DD or dd.

00 = Calm	12 = S.E.	24 = West.
02 = N.N.E.	14 = S.S.E.	26 = W.N.W.
04 = N.E.	16 = South.	28 = N.W.
06 = E.N.E.	18 = S.S.W.	30 = N.N.W.
08 = East.	20 = S.W.	32 = North.
10 = E.S.E.	22 = W.S.W.	

The number is increased by 50 in the text of the message if the barometric tendency is negative.

TABLE 2*d*.—d.

0 = Calm	3 = S.E.	6 = West.	9 = No observation.
1 = N.E.	4 = South.	7 = N.W.	
2 = East.	5 = S.W.	8 = North.	

TABLE 6*a*.—bb (Barometric Tendency).

Variation of the barometer in millimetres and tenths during the three hours preceding the time of observation. If the tendency is negative, 50 is added to the number DD indicating the direction of the wind.

LINDENBERG CODE FOR UPPER AIR INFORMATION

Upper Winds.—HHDFF HHDFF . . . addf ZZWVc.

Upper Air Temperature, etc.—HHTTT PPDDF HHTTT PPDDF ZZWVc.

(NOTE.—addf is a nephoscope group identified by its only containing four figures.)

The symbols have the following meanings:—

ZZ = Hour of observations (Central European Time. Subtract one hour to get G.M.T.).

W = Present weather in Old International Code.

V = Horizontal visibility in New International Code.

c = Barometric tendency (Code I below).

HH = Height above sea level in hectometres.

DD = Wind direction at height HH. Scale 0–32 (08 = East, etc.)

F = Wind force at height HH. (Code II below.)

a = Kind of upper cloud observed by nephoscope. (Code III.)

dd = Direction from which upper cloud moves. Scale 0–32 (08 = East, etc.)

f = Velocity-height ratio.

TTT = Temperature at height HH in degrees and tenths Centigrade (500 added for negative values).

PP = Percentage relative humidity (98 means 100 per cent. ; 99 means "impossible to report").

CODE I.

Barometric Tendency (c).

Code figure.

0	No appreciable variation ;	.. .. .	less than 0.5 mm. (in 3 hours).
1	Slow fall	.. .. .	0.5 mm. to 1.4 mm.
2	Moderate fall	.. .. .	1.5 mm. to 2.4 mm.
3	Rapid fall	.. .. .	2.5 mm. to 3.4 mm.
4	Very rapid fall	.. .. .	more than 3.4 mm.
5	Slow rise	.. .. .	0.5 mm. to 1.4 mm.
6	Moderate rise	.. .. .	1.5 mm. to 2.4 mm.
7	Rapid rise	.. .. .	2.5 mm. to 3.4 mm.
8	Very rapid rise	.. .. .	more than 3.4 mm.
9	Unsteady or impossible to report.		

CODE II.

Wind Speed (F).

This is expressed in metres per second.

For values 10 to 19, the number 33 is added to the figures giving wind direction DD, thus 578 means W. 18 m. per sec.

For values 20 to 29, the number 67 is added to the figures giving wind direction DD, thus 973 means NNW 23 m. per sec.

Values above 30 m. per sec. are given in words, thus:—

“976 36 sek m.” means NNW 36 m. per sec.

CODE III.

Upper Cloud (a).

1. Cirrus.
2. Cirro-stratus.
3. Cirro-cumulus.
4. Alto-cumulus.

AMERICAN CODE

(1).—SURFACE OBSERVATIONS (2 groups of 5 figures each).

First group of 5 figures—BBBDF.

BBB = barometric pressure in *inches* and hundredths, reduced to sea level (first figure omitted).

D = direction of surface wind.

0 = calm or no movement.

1 = N, 2 = N.E., 3 = E., 4 = S.E., 5 = S., 6 = S.W.,
7 = W., 8 = N.W.

F = force of wind on Beaufort Scale as in N.I.C. (except that forces 10, 11 and 12 are reported simply as 9 without any addition in plain language).

SECOND GROUP OF 5 FIGURES.—W¹bWAC.

W¹ = prevailing weather or state of weather at surface at time of ob.

1 = clear (3-tenths or less clouded).

2 = partly cloudy (4 to 7-tenths clouded).

3 = cloudy (8 to 10-tenths clouded).

4 = raining.

5 = snowing.

6 = thunderstorm.

7 = sleeting or hailing.

8 = dense fog.

b = pressure change in hundredths of an inch during 2 hrs preceding ob.

0 = change of less than 0.04 inch.

1 = increase of 0.04 inch.

2 = decrease of 0.04 inch.

3 = increase of 0.06 inch.

4 = decrease of 0.06 inch.

5 = increase of 0.08 inch.

6 = decrease of 0.08 inch.

7 = increase of 0.10 inch.

8 = decrease of 0.10 inch.

9 = increase or decrease of 0.12 inches or more (whether it is an increase or decrease can be determined by barometric tendency shown at surrounding stations).

W = amount of clouds—number of tenths of the sky observed.

- 0 = 1-tenth of sky or less covered.
- 2 = 2 to 3-tenths of sky covered.
- 4 = 4 to 5-tenths of sky covered.
- 6 = 6 to 7-tenths of sky covered.
- 8 = 8 to 10-tenths of sky covered.
- 10 = total cloudiness.

A = kinds of clouds.

- 0 = 1-tenth clouds or less (kind not indicated).
- 1 = upper clouds (cirrus, cirro-stratus, cirro-cumulus, alto-cumulus, or alto-stratus), rapidity not indicated.
- 2 = strato-cumulus moving slowly.
- 3 = strato-cumulus moving rapidly.
- 4 = cumulus moving slowly.
- 5 = cumulus moving rapidly.
- 6 = stratus moving slowly.
- 7 = stratus moving rapidly.
- 8 = nimbus or cumulo-nimbus moving slowly.
- 9 = nimbus or cumulo-nimbus moving rapidly.

C = direction of cloud movement.

- | | |
|-----------------------------|-----------------|
| 0 = no movement observable. | 5 = south. |
| 1 = north. | 6 = south-west. |
| 2 = north-east. | 7 = west. |
| 3 = east. | 8 = north-west. |
| 4 = south-east. | |

When both upper and lower clouds are observed, only the amount, kind, and direction of the lower clouds will be sent. In such cases the amount of the upper clouds, if any, can be determined approximately by taking the difference between the tenths of cloudiness interpreted from the figures showing "present weather" and "amount of clouds."

(2)—UPPER AIR OBSERVATIONS. $3D_1V_1D_2V_2 \quad 4D_3V_3D_4V_4$, etc.

The upper air observations are included in five groups and have identifying numbers 3 to 7, inclusive. The wind direction and force are indicated by the same numerals as for surface wind direction and force.

THIRD GROUP (upper air).—Two levels are included in this group, 250 metres and 500 metres. The first figure (3) identifies the group; the second figure indicates the wind direction at the lower elevation and the third figure the wind force at the lower elevation; the fourth and fifth figures represent, respectively, the wind direction and force at the higher elevation.

FOURTH GROUP (upper air).—Includes 1,000 and 1,500 metre elevations; same arrangement of the five significant figures as in the third group.

FIFTH GROUP (upper air).—Includes 2,000 and 3,000 metre elevations; same arrangement of the five significant figures as in the third group.

SIXTH GROUP (upper air).—Includes 4,000 metre elevation; same arrangement as in the third group, except that there will be only three figures in this group, followed by XX, as elevations in excess of 4,000 metres are reported only in the last group.

LAST GROUP (upper air).—Shows the highest elevation reached. The first figure (7) identifies the group as the one showing the maximum altitude (it may be the fourth, fifth, sixth or seventh group, dependent upon the actual elevation reached); the second and third figures indicate the elevation, in hundreds of metres; the fourth and fifth figures wind direction and velocity, respectively, at the indicated elevation. When the maximum elevation is 9,900 metres or more the figures 99 will be used.

SPECIFICATION OF THE BEAUFORT SCALE WITH

Beaufort Number.	Admiral Beaufort's General Description of Wind.	Admiral Beaufort's Specification, 1805.	Description of Wind.	Mode of Estimating aboard Sailing Vessels.		
0	Calm	Calm	—	—		
1	Light air ..	Just sufficient to give steerage way.	Light breeze	Sufficient wind for working ship.		
2	Slight breeze	That in which a well-conditioned man-of-war, with all sail set and "clean full," would go in smooth water from			Moderate breeze	Forces most advantageous for sailing with leading wind and all sail drawing.
3	Gentle breeze					
4	Moderate breeze					
5	Fresh breeze	Royals, etc.	Strong wind	Reduction of sail with necessary leading wind.		
6	Strong breeze	Single-reefed topsails or top-gallant sails.				
7	Moderate gale (High Wind)	Double-reefed topsails, jib, etc.				
8	Fresh gale .. (Gale)	Triple-reefed topsails, etc.	Gale forces	Considerable reduction of sail necessary even with wind quartering.		
9	Strong gale ..	Close-reefed topsails and courses.				
10	Whole gale ..	That with which she could scarcely bear close-reefed main topsail and reefed foresail.	Storm forces	Close reefed sail running, or hove to under storm sail.		
11	Storm ..	That which would reduce her to storm stay-sails.				
12	Hurricane ..	That which no canvas could withstand.	Hurricane ..	No sail can stand even when running.		

* It had been decided that for statistical purposes winds of force less than 8 shall not be counted as gales, and to avoid the ambiguity implied by the use of the term "moderate gale" for force 7 the Beaufort description has been modified by the substitution of the description in italics for forces 7 and 8.

EQUIVALENTS OF THE NUMBERS OF THE SCALE.

Beaufort Number.	Specification of Beaufort Scale.		Mean wind force in lb. per sq. ft. at standard density.	Equivalent velocity in miles per hour.	Limits of Velocity. Miles per hour.
	For Coast Use.	For Use on Land.			
0	Calm	Calm; smoke rises vertically.	0	0	Less than 1
1	Fishing smack * just has steerage way.	Direction of wind shown by smoke drift, but not by wind vanes.	0.1	2	1-3
2	Wind fills the sails of smacks, which then move at about 1-2 miles per hour.	Wind felt on face; leaves rustle; ordinary vane moved by wind.	0.8	5	4-7
3	Smacks begin to careen, and travel about 3-4 miles per hour.	Leaves and small twigs in constant motion; wind extends light flag.	1.8	10	8-12
4	Good working breeze; smacks carry all canvas, with good list.	Raises dust and loose paper; small branches are moved.	6.7	15	13-18
5	Smacks shorten sail ..	Small trees in leaf begin to sway; crested wavelets form on inland waters.	13.1	21	19-24
6	Smacks have double reef in main sail. Care required when fishing.	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	23	27	25-31
7	Smacks remain in harbour, and those at sea lie to.	Whole trees in motion; inconvenience felt when walking against wind.	36	35	32-38
8	All smacks make for harbour, if near.	Breaks twigs off trees; generally impedes progress.	54	42	39-46
9	—	Slight structural damage occurs (chimney pots and slates removed).	77	50	47-54
10	—	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	105	59	55-63
11	—	Very rarely experienced; accompanied by widespread damage.	140	68	64-75
12	—	—	Above 170	Above 75	Above 75

* The fishing smack in this column may be taken as representing a trawler of average type and trim. For larger or smaller boats and for special circumstances allowance must be made.

The following table enables inches of mercury to be put into millibar and *vice versa* :—

TABLE I.—PRESSURE.
Equivalents in Millibars of Inches of Mercury at 32° F. Lat. 45°.

Inches. and Tenths.	Hundredths of an inch.									
	0	1	2	3	4	5	6	7	8	9
	Millibars									
27.0	914.3	914.6	915.0	915.3	915.7	916.0	916.3	916.7	917.0	917.4
27.1	917.7	918.0	918.4	918.7	919.0	919.4	919.7	920.1	920.4	920.7
27.2	921.1	921.4	921.8	922.1	922.4	922.8	923.1	923.4	923.8	924.1
27.3	924.5	924.8	925.1	925.5	925.8	926.2	926.5	926.8	927.2	927.5
27.4	927.9	928.2	928.5	928.9	929.2	929.5	929.9	930.2	930.6	930.9
27.5	931.2	931.6	931.9	932.3	932.6	932.9	933.3	933.6	933.9	934.3
27.6	934.6	935.0	935.3	935.6	936.0	936.3	936.7	937.0	937.3	937.7
27.7	938.0	938.3	938.7	939.0	939.4	939.7	940.0	940.4	940.7	941.1
27.8	941.4	941.7	942.1	942.4	942.8	943.1	943.4	943.8	944.1	944.4
27.9	944.8	945.1	945.5	945.8	946.1	946.5	946.8	947.2	947.5	947.8
28.0	948.2	948.5	948.8	949.2	949.5	949.9	950.2	950.5	950.9	951.2
28.1	951.6	951.9	952.2	952.6	952.9	953.2	953.6	953.9	954.3	954.6
28.2	954.9	955.3	955.6	956.0	956.3	956.6	957.0	957.3	957.7	958.0
28.3	958.3	958.7	959.0	959.3	959.7	960.0	960.4	960.7	961.0	961.4
28.4	961.7	962.1	962.4	962.7	963.1	963.4	963.7	964.1	964.4	964.8
28.5	965.1	965.4	965.8	966.1	966.5	966.8	967.1	967.5	967.8	968.1
28.6	968.5	968.8	969.2	969.5	969.8	970.2	970.5	970.9	971.2	971.5
28.7	971.9	972.2	972.6	972.9	973.2	973.6	973.9	974.2	974.6	974.9
28.8	975.3	975.6	975.9	976.3	976.6	977.0	977.3	977.6	978.0	978.3
28.9	978.6	979.0	979.3	979.7	980.0	980.3	980.7	981.0	981.4	981.7
29.0	982.0	982.4	982.7	983.0	983.4	983.7	984.1	984.4	984.7	985.1
29.1	985.4	985.8	986.1	986.4	986.8	987.1	987.5	987.8	988.1	988.5
29.2	988.8	989.1	989.5	989.8	990.2	990.5	990.8	991.2	991.5	991.9
29.3	992.2	992.5	992.9	993.2	993.5	993.9	994.2	994.6	994.9	995.2
29.4	995.6	995.9	996.3	996.6	996.9	997.3	997.6	997.9	998.3	998.6
29.5	999.0	999.3	999.6	1000.0	1000.3	1000.7	1001.0	1001.3	1001.7	1002.0
29.6	1002.4	1002.7	1003.0	1003.4	1003.7	1004.0	1004.4	1004.7	1005.1	1005.4
29.7	1005.7	1006.1	1006.4	1006.8	1007.1	1007.4	1007.8	1008.1	1008.4	1008.8
29.8	1009.1	1009.5	1009.8	1010.1	1010.5	1010.8	1011.2	1011.5	1011.8	1112.2
29.9	1012.5	1012.8	1013.2	1013.5	1013.9	1014.2	1014.5	1014.9	1015.2	1015.6
30.0	1015.9	1016.2	1016.6	1016.9	1017.3	1017.6	1017.9	1018.3	1018.6	1018.9
30.1	1019.3	1019.6	1020.0	1020.3	1020.6	1021.0	1021.3	1021.7	1022.0	1022.3
30.2	1022.7	1023.0	1023.3	1023.7	1024.0	1024.4	1024.7	1025.0	1025.4	1025.7
30.3	1026.1	1026.4	1026.7	1027.1	1027.4	1027.7	1028.1	1028.4	1028.8	1029.1
30.4	1029.4	1029.8	1030.1	1030.5	1030.8	1031.1	1031.5	1031.8	1032.2	1032.5
30.5	1032.8	1033.2	1033.5	1033.8	1034.2	1034.5	1034.9	1035.2	1035.5	1035.9
30.6	1036.2	1036.6	1036.9	1037.2	1037.6	1037.9	1038.2	1038.6	1038.9	1039.3
30.7	1039.6	1039.9	1040.3	1040.6	1041.0	1041.3	1041.6	1042.0	1042.3	1042.6
30.8	1043.0	1043.3	1043.7	1044.0	1044.3	1044.7	1045.0	1045.4	1045.7	1046.0
30.9	1046.4	1046.7	1047.1	1047.4	1047.7	1048.1	1048.4	1048.7	1049.1	1049.4
31.0	1049.8	1050.1	1050.4	1050.8	1051.1	1051.5	1051.8	1052.1	1052.5	1052.8
31.1	1053.1	1053.5	1053.8	1054.2	1054.5	1054.8	1055.2	1055.5	1055.9	1056.2
31.2	1056.5	1056.9	1057.2	1057.5	1057.9	1058.2	1058.6	1058.9	1059.2	1059.6
31.3	1059.9	1060.3	1060.6	1060.9	1061.3	1061.6	1062.0	1062.3	1062.6	1063.0
31.4	1063.3	1063.6	1064.0	1064.3	1064.7	1065.0	1065.3	1065.7	1066.0	1066.4
Thousandths of an Inch.										
Inch	.001	.002	.003	.004	.005	.006	.007	.008	.009	
Millibars.	.0	.1	.1	.1	.2	.2	.2	.3	.3	

1000 millibars = 1 bar = 29.5306 mercury-inches = 750.076 mercury millimetres (using
1 inch = 2.54000 cm.)

TABLE II.—TABLE OF CORRECTIONS FOR REDUCING BAROMETRIC HEIGHTS TO 0° C. AND TO SEA LEVEL.

NOTE.—The barometric reading should first be corrected for index error. This error may be neglected if it is less than 0.3 mm. The + sign indicates that the correction is to be *added* to the barometric ruling. The — sign indicates that the correction is to be *subtracted*.

Temperature by the thermometer attached to the barometer		— 4° C. 24.8° F.	— 2° C. 28.4° F.	0° C. 32° F.	+ 2° C. 35.6° F.	+ 4° C. 39.2° F.	6° C. 42.8° F.	8° C. 46.4° F.	10° C. 50° F.	12° C. 53.6° F.	14° C. 57.2° F.	16° C. 60.8° F.	18° C. 64.4° F.	20° C. 68° F.	22° C. 71.6° F.	24° C. 75.2° F.	26° C. 78.8° F.	28° C. 82.4° F.
M'tres.	Ft. In.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
		Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
0	0	+0.5	+0.3	0.0	—0.2	—0.5	—0.7	—1.0	—1.2	—1.5	—1.7	—2.0	—2.2	—2.5	—2.7	—3.0	—3.2	—3.5
1	3	+0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1	3.4
2	6	+0.8	0.5	0.3	0.0	0.3	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0	3.2
3	9	+0.9	0.6	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1
4	13	+1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.8	3.0
5	16	+1.2	0.9	0.7	0.4	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.7	2.9
6	19	+1.3	1.0	0.8	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.6	2.8
7	22	+1.4	1.2	0.9	0.6	0.3	+0.1	0.1	0.4	0.6	0.9	1.1	1.4	1.6	1.9	2.2	2.4	2.7
8	26	+1.5	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.1	2.3	2.6
9	29	+1.7	1.4	1.2	0.8	0.6	0.3	+0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.6	2.0	2.2	2.5
10	32	+1.8	1.6	1.3	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.0	1.3	1.5	1.9	2.1	2.4
11	36	+1.9	1.7	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.4	1.8	2.0	2.2
12	39	+2.0	1.8	1.5	1.2	1.0	0.7	0.5	0.2	0.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1
13	42	+2.2	1.9	1.7	1.3	1.1	0.8	0.6	0.3	+0.1	0.2	0.4	0.7	0.9	1.2	1.5	1.8	2.0
14	45	+2.3	2.0	1.8	1.5	1.2	0.9	0.7	0.4	0.2	0.0	0.3	0.6	0.8	1.1	1.4	1.6	1.9
15	49	+2.4	2.2	2.0	1.6	1.4	1.1	0.8	0.6	0.3	+0.1	0.2	0.5	0.7	1.0	1.3	1.5	1.8
16	52	+2.5	2.3	2.1	1.7	1.5	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4	1.6
17	55	+2.6	2.4	2.2	1.9	1.6	1.3	1.1	0.8	0.6	0.3	+0.1	0.3	0.5	0.8	1.0	1.3	1.5
18	59	+2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	0.2	0.1	0.4	0.6	0.9	1.2	1.4
19	62	+2.9	2.6	2.4	2.1	1.9	1.5	1.3	1.0	0.8	0.6	0.3	0.0	0.3	0.5	0.8	1.0	1.3
20	65	+3.0	2.8	2.5	2.3	2.0	1.7	1.4	1.2	0.9	0.7	0.4	+0.1	0.2	0.4	0.7	0.9	1.2
21	68	+3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.5	0.2	0.1	0.3	0.6	0.8	1.1
22	72	+3.3	3.0	2.8	2.5	2.2	1.9	1.7	1.4	1.2	0.9	0.6	0.3	+0.1	0.2	0.4	0.7	0.9
23	75	+3.4	3.1	2.9	2.6	2.4	2.1	1.8	1.5	1.3	1.0	0.8	0.4	0.2	0.1	0.3	0.6	0.8

Height of barometer column above sea level.

TABLE III.—CORRECTIONS FOR REDUCING THE BAROMETER READINGS FOR GRAVITY AT
LATITUDE 45° .For Latitudes 0° to 44° N. or S. the correction is to be *subtracted*." 46° to 90° N. of S. " " " *added*.

Latitude.		HEIGHT OF THE BAROMETER IN INCHES.								
		27.0	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0
°	°	In.	In.	In.	In.	In.	In.	In.	In.	In.
45	45	.000	.000	.000	.000	.000	.000	.000	.000	.000
44	46	.002	.002	.003	.003	.003	.003	.003	.003	.003
43	47	.005	.005	.005	.005	.005	.005	.005	.006	.006
42	48	.007	.007	.008	.008	.008	.008	.008	.008	.008
41	49	.010	.010	.010	.010	.010	.011	.011	.011	.011
40	50	.012	.012	.013	.013	.013	.013	.013	.014	.014
39	51	.015	.015	.015	.015	.016	.016	.016	.016	.017
38	52	.017	.017	.018	.018	.018	.018	.019	.019	.019
37	53	.019	.020	.020	.020	.021	.021	.021	.022	.022
36	54	.022	.022	.022	.023	.023	.024	.024	.024	.025
35	55	.024	.024	.025	.025	.026	.026	.027	.027	.027
34	56	.026	.027	.027	.028	.028	.029	.029	.030	.030
33	57	.028	.029	.029	.030	.031	.031	.032	.032	.033
32	58	.031	.031	.032	.032	.033	.033	.034	.035	.035
31	59	.033	.033	.034	.035	.035	.036	.036	.037	.038
30	60	.035	.036	.036	.037	.038	.038	.039	.039	.040
29	61	.037	.038	.038	.039	.040	.040	.041	.042	.043
28	62	.039	.040	.041	.041	.042	.043	.043	.044	.045
27	63	.041	.042	.043	.043	.044	.045	.046	.046	.047
26	64	.043	.044	.045	.045	.046	.047	.048	.049	.049
25	65	.045	.046	.047	.047	.048	.049	.050	.051	.052
24	66	.047	.048	.049	.049	.050	.051	.052	.053	.054
23	67	.049	.049	.050	.051	.052	.053	.054	.055	.056
22	68	.050	.051	.052	.053	.054	.055	.056	.057	.058
21	69	.052	.053	.054	.055	.056	.057	.058	.059	.060
20	70	.054	.055	.056	.057	.058	.059	.060	.061	.062
19	71	.055	.056	.057	.058	.059	.060	.061	.062	.063
18	72	.057	.058	.059	.060	.061	.062	.063	.064	.065
17	73	.058	.059	.060	.061	.062	.063	.064	.065	.067
16	74	.059	.060	.061	.063	.064	.065	.066	.067	.068
15	75	.061	.062	.063	.064	.065	.066	.067	.068	.070
14	76	.062	.063	.064	.065	.066	.067	.069	.070	.071
13	77	.063	.064	.065	.066	.068	.069	.070	.071	.072
12	78	.064	.065	.066	.067	.069	.070	.071	.072	.073
11	79	.065	.066	.067	.068	.070	.071	.072	.073	.074
10	80	.066	.067	.068	.069	.071	.072	.073	.074	.075
9	81	.067	.068	.069	.070	.071	.073	.074	.075	.076
8	82	.067	.068	.070	.071	.072	.073	.075	.076	.077
7	83	.068	.069	.070	.072	.073	.074	.075	.077	.078
6	84	.068	.070	.071	.072	.073	.075	.076	.077	.079
5	85	.069	.070	.071	.073	.074	.075	.077	.078	.079
4	86	.069	.071	.072	.073	.074	.076	.077	.078	.080
3	87	.070	.071	.072	.073	.075	.076	.077	.079	.080
2	88	.070	.071	.072	.074	.075	.076	.078	.079	.080
1	89	.070	.071	.072	.074	.075	.076	.078	.079	.080
0	90	.070	.071	.073	.074	.075	.076	.078	.079	.080

TABLE IV.

Relation between inches and millimetres for comparison of readings of barometers graduated in these units.

In.	Mm.	In.	Mm.	In.	Mm.	In.	Mm.
27.0	685.8	28.0	711.2	29.0	736.6	30.0	762.0
27.2	690.9	28.2	716.3	29.2	741.7	30.2	767.1
27.4	696.0	28.4	721.4	29.4	746.8	30.4	772.2
27.6	701.0	28.6	726.4	29.6	751.8	30.6	777.2
27.8	706.1	28.8	731.5	29.8	756.9	30.8	782.3

NOTE.—(1) The table is based on the *legal* relation 1 in. = 2.5400 cm., which agrees very closely indeed with the best experimental comparisons.

(2) As millimetre barometers have the same standard temperature 0° C. for the brass scale and for the mercury, while inch barometers have a standard 32° F. for the mercury and 60° F. for the brass scale, the readings require correction for temperature by appropriate tables before the comparison can be made.

TABLE V.

TABLE FOR CONVERSION OF DEGREES FAHRENHEIT INTO DEGREES CENTIGRADE AND DEGREES ABSOLUTE.

°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.	°F.	°C.	a.
20	-6.7	266.3	45	7.2	280.2	70	21.1	294.1	95	35.0	308.0
21	-6.1	266.9	46	7.8	280.8	71	21.7	294.7	96	35.6	308.6
22	-5.6	267.4	47	8.3	281.3	72	22.2	295.2	97	36.1	309.1
23	-5.0	268.0	48	8.9	281.9	73	22.8	295.8	98	36.7	309.7
24	-4.4	268.6	49	9.4	282.4	74	23.3	296.3	99	37.2	310.2
25	-3.9	269.1	50	10.0	283.0	75	23.9	296.9	100	37.8	310.8
26	-3.3	269.7	51	10.6	283.6	76	24.4	297.4	101	38.3	311.3
27	-2.8	270.2	52	11.1	284.1	77	25.0	298.0	102	38.9	311.9
28	-2.2	270.8	53	11.7	284.7	78	25.6	298.6	103	39.4	312.4
29	-1.7	271.3	54	12.2	285.2	79	26.1	299.1	104	40.0	313.0
30	-1.1	271.9	55	12.8	285.8	80	26.7	299.7	105	40.6	313.6
31	-0.6	272.4	56	13.3	286.3	81	27.2	300.2	106	41.1	314.1
32	0.0	273.0	57	13.9	286.9	82	27.8	300.8	107	41.7	314.7
33	+0.6	273.6	58	14.4	287.4	83	28.3	301.3	108	42.2	315.2
34	1.1	274.1	59	15.0	288.0	84	28.9	301.9	109	42.8	315.8
35	1.7	274.7	60	15.6	288.6	85	29.4	302.4	110	43.3	316.3
36	2.2	275.2	61	16.1	289.1	86	30.0	303.0	111	43.9	316.9
37	2.8	275.8	62	16.7	289.7	87	30.6	303.6	112	44.4	317.4
38	3.3	276.3	63	17.2	290.2	88	31.1	304.1	113	45.0	318.0
39	3.9	276.9	64	17.8	290.8	89	31.7	304.7	114	45.6	318.6
40	4.4	277.4	65	18.3	291.3	90	32.2	305.2	115	46.1	319.1
41	5.0	278.0	66	18.9	291.9	91	32.8	305.8	116	46.7	319.7
42	5.6	278.6	67	19.4	292.4	92	33.3	306.3	117	47.2	320.2
43	6.1	279.1	68	20.0	293.0	93	33.9	306.9	118	47.8	320.8
44	6.7	279.7	69	20.6	293.6	94	34.4	307.4	119	48.3	321.3

TABLE VI.
WIND VELOCITY.

Conversion Table from Miles per Hour to Metres per Second.

1 mile per hour = 0.44704 metre per second.

Miles per Hour	0	1	2	3	4	5	6	7	8	9
	Metres per Second.									
0	0.0	0.4	0.9	1.3	1.8	2.2	2.7	3.1	3.6	4.0
10	4.5	4.9	5.4	5.8	6.3	6.7	7.2	7.6	8.0	8.5
20	8.9	9.4	9.8	10.3	10.7	11.2	11.6	12.1	12.5	13.0
30	13.4	13.9	14.3	14.8	15.2	15.6	16.1	16.5	17.0	17.4
40	17.9	18.3	18.8	19.2	19.7	20.1	20.6	21.0	21.5	21.9
50	22.4	22.8	23.2	23.7	24.1	24.6	25.0	25.5	25.9	26.4
60	26.8	27.3	27.7	28.2	28.6	29.1	29.5	30.0	30.4	30.8
70	31.3	31.7	32.2	32.6	33.1	33.5	34.0	34.4	34.9	35.3
80	35.8	36.2	36.7	37.1	37.6	38.0	38.4	38.9	39.3	39.8
90	40.2	40.7	41.1	41.6	42.0	42.5	42.9	43.4	43.8	44.3
100	44.7	45.2	45.6	46.0	46.5	46.9	47.4	47.8	48.3	48.7

TABLE VII.
RAINFALL TABLE FOR CONVERSION OF INCHES TO MILLIMETRES.

Ins.	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
	Millimetres.									
0.0	0.00	0.25	0.51	0.76	1.02	1.27	1.52	1.78	2.03	2.29
0.1	2.54	2.79	3.05	3.30	3.56	3.81	4.06	4.32	4.57	4.83
0.2	5.08	5.33	5.59	5.84	6.10	6.35	6.60	6.86	7.11	7.37
0.3	7.62	7.87	8.13	8.38	8.64	8.89	9.14	9.40	9.65	9.91
0.4	10.16	10.41	10.67	10.92	11.18	11.43	11.68	11.94	12.19	12.45
0.5	12.70	12.95	13.21	13.46	13.72	13.97	14.22	14.48	14.73	14.99
0.6	15.24	15.49	15.75	16.00	16.26	16.51	16.76	17.02	17.27	17.53
0.7	17.78	18.03	18.29	18.54	18.80	19.05	19.30	19.56	19.81	20.07
0.8	20.32	20.57	20.83	21.08	21.34	21.59	21.84	22.10	22.35	22.61
0.9	22.86	23.11	23.37	23.62	23.88	24.13	24.38	24.64	24.89	25.15
1.0	25.40	25.65	25.91	26.16	26.42	26.67	26.92	27.18	27.43	27.69
1.1	27.94	28.19	28.45	28.70	28.96	29.21	29.46	29.72	29.97	30.23
1.2	30.48	30.73	30.99	31.24	31.50	31.75	32.00	32.26	32.51	32.77
1.3	33.02	33.27	33.53	33.78	34.04	34.29	34.54	34.80	35.05	35.31
1.4	35.56	35.81	36.07	36.32	36.58	36.83	37.08	37.34	37.59	37.85
1.5	38.10	38.35	38.61	38.86	39.12	39.37	39.62	39.88	40.13	40.39
1.6	40.64	40.89	41.15	41.40	41.66	41.91	42.16	42.42	42.67	42.93
1.7	43.18	43.43	43.69	43.94	44.20	44.45	44.70	44.96	45.21	45.47
1.8	45.72	45.97	46.23	46.48	46.74	46.99	47.24	47.50	47.75	48.01
1.9	48.26	48.51	48.77	49.02	49.28	49.53	49.78	50.04	50.29	50.55
2.0	50.80	51.05	51.31	51.56	51.82	52.07	52.32	52.58	52.83	53.09

(1)—WEATHER REPORTS.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ALASKA Dutch Harbour, NPR, 2,255 sp.	0530 0930	—	S.	U.S.A. (special)	InInIn BBBDF W'bWAC NOTE: These reports also sent on request
ALGERIA Oran (Ain-el-Turek), FUK, 3,500 c.w.	0140 0905 1345 1845	0100 0700 1300 1800	S. S. U.W. S. S.	French Met. Code " " " "	SYNOPTIC REPORTS. (1) "Météo Oran" (31, 32, 61) InIn BBTTT cbbP DDFNV (1) "Météo Oran" (01-46) InIn BBTTT cbb(SVs)DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ mmRRd (2) "Pilot" InInGG ddff ddff ddff, etc. (1) "Météo Oran" (31-69) InIn BBTTT cbb(SVs) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ (1) "Météo Oran" (31-69) InIn BBTTT cbb(SVs) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ MMt ₁ t ₂ d NOTES: (1) See under French Meteorological Code and Eiffel Tower Synoptic (pages 000) for details of code (2) Stations 07 and 15 send index number and first three groups only of "surface" ob.

Stations:					
01 TANGIER	11 Taza	33 SETIF	40 Timimoun	61 TUNIS	68 Metlaoui
03 RABAT	12 Ujda	34 BISKRA	41 Laghwat	62 BIZERTA	69 Qabes
04 Casablanca	13 Marrakesh	35 Touggourt	42 Ain-Seira	63 Sfax	80 Funchal
06 Mogador	14 Midelt	36 Ouargla	43 El-Goléa	64 Medinine	81 Angra
07 AGADIR	15 BU DENIB	37 In-Salah	44 El-Oued	65 Tozeur	82 Port Etienne
09 Meknes	31 ORAN	38 Colomb-Béchar	45 Ghardaïa	66 Ben Gardane	83 Dakar
10 FEZ	32 ALGIERS	39 Béni-Abbès	46 Adrar	67 Susa	

(1)	(2)	(3)	(4)	(5)	(6)
ARABIA Aden, BZF, 2,000 sp.	0130 1330	— —	S.W. S.W.	p.l. p.l.	Plain language message relating to Eastern portion of Arabian Sea only prefixed by words "East Arabian Sea." The warnings deal exclusively with storms, stormy winds, and the absence of storms. Frequently the phrase "Weather normal" is used in these messages. For the information of mariners and others interested, the meaning of this phrase is:— "As far as coast observations and available ships' reports indicate there is no reason for thinking that a storm has formed or is forming." (This report is prepared in the Meteorological office at Simla (India).)
ARGENTINE Buenos Ayres (Darsena Norte), LIH, 1,000 sp.	0205	—	S.F.	p.l.	En clair (Spanish) message followed by forecast for ensuing 24 hours for the Rio de la Plata.
AUSTRALIAN COMMON-WEALTH Perth, VIP Sydney, VIS Melbourne, VIM Adelaide, VIA Brisbane, VIB* Geraldton, VIN Broome, VIO Wyndham, VIW Darwin, VID	1300 1030 2230 1100 1130 1200 request " " "		S.F. W.	p.l.	NOTES (1). An official ocean forecast is transmitted daily from the Central Weather Bureau, Melbourne, to all radio stations in Australia, also Port Moresby (New Guinea), and it is preceded by a specific statement of the sea conditions existing at 9 a.m. around Australia, and sea disturbances off any part of the coast. (2) Reports are transmitted, when necessary, at other times than those scheduled.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
AUSTRALIAN COMMON- WEALTH — <i>cont.</i>					
Thursday Is., VII* ..	"				(3) Stations marked * also transmit ocean forecasts and cyclone warnings, at 0630 (Sun. excepted), from December to April. These messages give the state of the weather, direction and force of wind, and the state of the sea at 0500 along the Queensland Coast, followed by a forecast of probable conditions during the next 24 hours. On Saturdays, forecast extends for 48 hours instead of 24 hours. QUEENSLAND AND CORAL SEA: CYCLONE WARNINGS.
Cooktown, VIC* ..	"				
Townsville, VIT* ..	"				
Rockhampton, VIR* ..	"				
Flinders Is., VII ..	"				
Hobart (Tasmania), VIH ..	"				
Esperance, VIE ..	"				(4) The following arrangements have been made for the issue of warnings of cyclone disturbances off the coast of Queensland from December to April:— 1. By arrangement with the Commonwealth Meteorological Bureau the warning is dispatched by urgent telegram (Sunday included) to the W/T stations mentioned in the schedule, who will broadcast it to ships. 2. In special cases the Meteorologist indicates when his next report will be issued.
(All 600 sp.)					
Willislets, CGI*, 600 sp. ..	—	—	—	—	
AUSTRIA					SYNOPTIC REPORTS.
Laaerberg (near Vienna), OHL, 5,700 c.w. (3,500 sp. in case of breakdown)	0820	2000	S.	O.I.C.	"Météo Wien" InIn BBBDD FWTTT BBBDD FWTTT bbRRR MMmm (first two groups refer to 2000 G.M.T. of previous day). "Pilot Wien," HHDDF HHDDF, etc. InIn BBBDD FWTTT Stations: 01 Vienna 02 Sonnblick (3106m.), 03 Feldkirch 04 Innsbruck, 05 Salzburg, 06 Linz 07 Graz, 08 Klagenfurt, 09 Celovec (2,041 m.) NOTE: In the case of high-altitude stations and 09, bar. pressure, is not reduced to sea level.
	0820 1520	0600 1300	U.W. S.	Linden- berg O.I.C.	
BELGIUM					AVIATION SYNOPTIC.
Brussels, OPO (or OPVH), 1,680 c.w.	0322*	0300	S.	N.I.C.	"Avis pour Aviation" [0300] (or) xInIn wwVhL NDDFW (Where x is a check figure being the sum of the digits in the sum of the figures wwVhL)
	0422* 0522* 0622* 0722	0400 0500 0600 0700	S. S. S. S.	" " " "	Same form as 0322 message
*These messages are discontinued during the winter months.					(1) "Avis pour Aviation" [0700] (or) InIn BBBDD FwwTT cbWVH AL RRmmr (CaddF ₁ —) x ₁ x ₂ x ₃ x ₄ x ₅ y ₁ y ₂ y ₃ y ₄ y ₅ (or) xInIn wwVhL (2) "Pilot" (or) h ₁ ddvv, h ₂ ddvv etc. (3) Ob. from stations in the Rhine Area "Avis pour aviation" [0800] (or, 02) xInIn(Vs) wwVhL NDDFW (or) xInIn wwVhL (1) Same form as 0822 message (2) Ob. from stations in the Rhine Area (1) "Avis pour Aviation" [1000] (or) InIn BBBDD FwwTT cbWVH AL (CaddF ₁ —) (02, 03) as for 0822 message x ₁ x ₂ x ₃ x ₄ z' y ₁ y ₂ y ₃ y ₄ y ₅ (2) Ob. from stations in the Rhine Area As for 0822 message Same form as 0822 message (1) Same form as Part (1) of 1022 message (2) Same form as Part (2) of 0722 message (3) Ob. from stations in the Rhine Area
	0700	0700	U.W.	"	
	0822	0800	S.	special N.I.C.	
	0922	0900	S.	"	
	1022	1000	S.	special N.I.C.	
	1122	1100	S.	special N.I.C.	
	1222	1200	S.	"	
	1322	1300	S.	"	
		1300	U.W. S.	" special	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
BELGIUM—contd.					
	1422	1400	S.	N.I.C.	Same form as 0822 message
	1522	1500	S.	"	Same form as 0822 message
	1622	1600	S.	"	Same form as Part (1) of 1022 message
	1822	1800	S.	"	(1) "Avis pour aviation" [1800] (01) InIn BBBDD FwwTT cbWVH ALaNh RRMMr x'1x'2x'3x'4x'5 z' ——— y'1y'2y'3y'4y'5 (03) x1nIn wwVhL
		1800	U.W.	"	(2) and (3) as for Parts (2) and (3) of 0722 message Stations: 01 Brussels, 02 Ostend, 03 Haren
BERMUDA Bermuda Dockyard, BZB, 1,600 sp., for 0015 and 1215 messages, 600 sp. for other messages	0015 0020 1215 1220	—	—	p.l.	Weather conditions prevailing at Bermuda
BRAZIL Rio do Governador (Rio de Janeiro), SOH, 1,800	0000* 1200 1500 2100 1800	— 1200	S. S.	p.l. N.I.C. (mod.)	<i>En clair</i> messages. SYNOPTIC REPORTS. InIn BBBDDFWWS NOTES: (1) W (state of atmosphere) is in O.I.C. (2) S (state of sea), according to following code: 0 Smooth. 3 Slight sea. 6 Ocean rollers. 1 Calm. 4 Moderate 7 Heavy ocean 2 Ground sea. rollers. swell. 5 Heavy sea. 8 Hurricane. (3) x = missing ob.

Stations:

S.L. São Luiz.	B.H. Bahia.	R.J. Rio de Janeiro	P.G. Paran- agua.	R.G. Rio Grande.	M.M. Monte- video.
F.T. Fort- aleza.	V.T. Victoria.	S.P. São Paulo.	F.P. Florian- opolis.	P.A. Porte Alegre.	B.A. Buenos Aires.
R.E. Recife.	C.F. Cabo Frio.	S.T. Santos.		C.B. Corumba.	

(1)	(2)	(3)	(4)	(5)	(6)
BRITISH HONDURAS. Amaze, VPP, 1,500 ..	0000 1140 when necessary	—	—	W.	Weather reports transmitted from June to November inclusive.
BRITISH INDIA Karachi, VWK, 2,000 sp. ..	0130 1330	—	—	p.l.	The report sent out from Karachi and Bombay gives the weather conditions in the East Arabian Sea, while that broadcast from the other four stations refers to the Bay of Bengal.
Bombay, VWB, 2,000 sp. ..	0100 1300	—	—	p.l.	The same reports are broadcast from Aden Radio BZF on 2,000 m. at 0130 and 1330 and from Matara, Ceylon, BZE, on 2,000 m. at 0135 and 1335
Madras, VWM, 600 sp. ..	0105 1305	—	—	p.l.	
Calcutta, VWC, 2,000 sp. ..	0130* 1330*	—	—	p.l.	
Canton, VTR, 1,200 sp. ..	0100 1300	—	—	p.l.	
Port Blair, VTP (Andaman Is.), 1,200 sp.	0130 1330	—	—	p.l.	
BULGARIA Sofia, FF, 3,500 sp. ..	0655 1355	0530 1230	S. S.	O.I.C. "	SYNOPTIC REPORTS. "Météo Sofia" (1) 0530 BBBDD FWTTTC βbbRR MMmm 1230 BBBDD FWTT βbb

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CANADA					
British Columbia					
Digby Is., VAI ..	request	—	F.	p.l.	Weather forecasts issued by the Canadian Meteorological Service transmitted to any station upon request.
Dead Tree Point, VAH ..					
Bull Harbour, VAG ..					
Alert Bay, VAF ..					
Cape Lazo, VAC ..					
Estevan, VAE ..					
Point Grey, VAB ..					
Pachena, VAD ..					
Gonzales Hill (Victoria), VAK (All 600 sp.)					
Nova Scotia					
Cape Sable, VCU	0200 1400	—	F.	p.l.	do. do. do.
Camperdown, VCS	request				
North Sydney, VCO	"				
Sable Island, VCT	"				
Lurcher Lt.-Vessel, VDR .. (All 600 sp.)	"	—	—	—	This station also keeps watch for the first half of every odd hour from 1100 to 2300 and from 0200 to 0230 G.M.T.
Great Lakes					
Kingston, VBH ..	0400	—	F.	p.l.	Forecasts compiled by the Canadian Meteorological Service, Toronto.
Toronto, VBG ..	0340				
Port Burwell, VBF ..	0400				NOTES: (1) Reports also transmitted upon request. (2) These stations are only open during season of navigation.
Point Edward, VBE ..	0410				
Midland, VBC ..	0400				
Sanet Ste Marie, VBB ..	0420				
Port Arthur, VBA ..	0430				
Tobermory, VBD ..	request				
New Brunswick					
St. John, VAR ..	request	—	F.	p.l.	Weather forecast issued by Canadian Meteorological Service.
Cape Bear, VCP ..	request	—	F.	p.l.	
Grindstone Island, VCN ..					
Grosse Island, VCD ..					
Quebec, VCC ..					
(All 600 sp.)					
Clarke City, VCK ..	request		F.	p.l.	do do do do.
Father Point, VCF ..					NOTE: These stations are only open during the season of navigation.
Montreal, VCA ..					
Fame Point, VCG ..	0145 1345				
	request				
Heath Point Lt.-Vessel, VCI	request	—	F.	p.l.	Weather forecast as above. This station only open during the season of navigation, keeps watch for the first half of every odd hour from 1100 to 2300 and from 0200 to 0230 G.M.T.
CAPE VERDE ISLANDS					
São Vicente, CRF, 1,000 sp.	1400	—	F.	p.l.	Forecast for whole of Cape Verde Islands
CEYLON					
Matara, BZE, 2,000 sp. ..	0135 1335	—	S.W. S.W.	p.l. p.l.	The message consists of two portions: the first part refers to the Bay of Bengal, prefixed by the word "Bay"; the second part to the Arabian Sea, prefixed by the word "Arabian Sea."

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CHILE					SYNOPTIC REPORTS.
Valparaiso, CCE, 1,000 sp. except Sundays and holidays)	0100*	2043	S.	American (mod.) p.l.	"O.M.C." (Meteorological Office of Chile) In BBDF Followed by summary of weather changes which have taken place during the day. Forecast and statement of probable ap- proach of bad weather.
	1700	1243	F. S. W.	p.l. American p.l.	In BBDF Storm warnings are issued, when necessary, after the above messages. Stations: V Valparaiso. M Mocha. P Punta T Talcahuano. G Guafo. Arenas. C Corral. R. Raper. O Puerto J Juan Montt. Fernandez. Q Coquimbo.
					NOTES: (1) BB = bar. pressure in mm. initial figure 7 omitted. (2) If the whole of the data from any station is missing, the word "No" is sent before the station letter. (3) Other missing ob. are replaced by "x." (4) If the weather is not good at the ports indicated, there will be added in the current language some of the words "Temporal" (gale), "Lluvia" (rain), "Neblina" (fog), "Sol" (sunny) Repeat of messages from Valparaiso (above)
Talcahuano, CCK, 1,900 sp.	0130 1730	—	—	—	
CHINA					SYNOPTIC REPORTS.
Shanghai, FFZ, 750 sp.	0300	0100	S. W. U.W.	p.l. special	(1) Report <i>en clair</i> sent in French and repeated in English. (2) Typhoon and gale warnings in same code as for Kien An (see under French Indo China). (3) "Air currents." Altitudes are grouped and are indicated by the words "high" (15,000 to 6,000 metres), "mean" (5,500 to 2,500 metres) and "low" (2,000 to 500 metres). For each of these groups the direction of the wind is given <i>en clair</i> , i.e.—N., N.E., etc.; several directions may figure for the same group and they refer to the wind at decreasing altitudes. NOTES: The observations are taken im- mediately before transmission. The word "nil" is used when the observa- tions for an altitude are missing. (4) (Observations transmitted to Tsingtao)— In IG BBBDD FwTTT NOTES: (1) G = Hour and date of observa- tion (a letter). X = Morning Observations. Y = Evening When the name of the observation station only is transmitted it signifies that the observations were made a short time before the transmission. (2) TTT = Temperature in degrees and tenths (500 is added for negative temperatures) Stations: S Shanghai T Tomsk. I Itchang. W Wen chau R Irkutsk. K Kiukiang. F Fu chau C Chunking (Sharp Peak). As for 0300 message (1-4) above. As for 0300 message (1), (2) and (4) above.
	0900 1400 1800 0000 1000 1300	0700 1200 1200	— S.W. S.W. S.W. S.W. S.W.	— — — p.l. p.l. p.l.	"QST, QST, QST" <i>En clair</i> message in English giving date, time, location of pressure, direction and force of wind, state of weather. This message is repeated twice.
Tsingtao, JAN, 600 sp.					

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
CHINA—contd.					
Keelung (Formosa), JFK, 600 sp.	1230	—	W.	—	The message is sent in English, and com- mences:— QST QST QST. This is followed by the warning (sent twice) which will contain the date and time of observation; whether typhoon or depression; position of centre; remarks on direction of movement and conditions. The information given in the following order:— (1) <i>Warning</i> : Typhoon. Depression (2) <i>Position</i> : Latitude. Longitude (3) <i>Direction</i> : Moving N. or N.N.E., N.N.W. W. recurving N., N.E., etc. Stationary Unknown (4) <i>Remarks</i> : Forming Actual direction and intensity unknown Heave swell rising. Severe Barometer falling rapidly at ——— Barometer falling, with stormy weather Centre approaching to ——— Centre will cross Formosa. Centre will pass near Keelung. Centre will pass Bashee channel. Centre moving slowly. Not developed fully. Intensity subsiding. Centre entered China continent. Filling up. Etc. etc.
CUBA					
Guantanamo, NAW, 2,750 sp.	0200	—	S.	p.l.	Weather reports are transmitted only during the hurricane season (June 1st to November 1st). Hurricane warnings are transmitted issued by the Washington Weather Bureau repeated every 4 hours.
	—	—	W.	p.l.	
CZECHO-SLOVAKIA					
Prague, PRG, 4,500 c.w.	0930	0700	S.	N.I.C.	SYNOPTIC REPORTS. "Météo Tchecoslovaque" (01) InIn BBBDD FwwTT cbWVH AL RRmmr C ₁ ddVV (05-32) InIn BBBDD FwwTT cbV ALaNh RRmmr "Sondages" (01, 05, 22-34) InIn h _r h ₁ ddvv etc. (01) InIn BBBDD FwwTT cbWVH AL C ₁ ddVV (05-32) InIn BBBDD FwwTT cbV ALaNh (01) InIn BBBDD FwwTT cbWVH AL RRMMr C ₁ ddVV (05-32) InIn BBBDD FwwTT cbV ALaNh RRMMr Synoptic Stations: 01 Prague 23 Stara Dala 05 Cheb 25 Kosice 06 Milesouka 32 Olomouc 22 Bratislava 34 Nitra
	1530	1300	S.	"	
	2030	1800	S.	"	
			U.W.	"	
DANZIG FREE STATE					
Danzig, KAZ, 1,950 sp	0735	0700	S.	German	SYNOPTIC REPORTS. BBBDD Fw ₁ TTW cbbRR MMmmW V BBBDD Fw ₁ TTW' cbbHA ₁ BBBDD Fw ₁ TTW' cbb Station: Danzig State Ob. <i>En clair</i> message giving general review of weather conditions prevailing in the North and the Western and Eastern Baltic, and forecast for the Eastern part of the Baltic Baltic coast valid for 24 hours, also warnings for the same regions
	1335	1300	S.	Met.	
	1835	1800	S.	"	
	request	—	S.F.	p.l.	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
DENMARK					SYNOPTIC.
Lyngby (near Copenhagen), OXE, 3,650 c.w.	0735	0700	S.	N.I.C.	"Meteo Danois" (01, 02) InIn BBBDD FwwTT cbWVH ALaNH RRSVsr C ₁ ddVV (03, 04, 05) InIn BBBDD FwwTT cbWVH ALaNH RRSVsr
	1335	1300	S.	"	"Meteo Danois" (01, 02) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (03, 04, 05) InIn BBBDD FwwTT cbWVH ALaNH
	1835	1800	S.	"	Same form as 0735 message above. NOTES: (1) ob. omitted from one message are transmitted at the beginning of the next and the time of ob. is indicated by adding hour of ob. to index number of station. (2) Storm warnings are issued, when neces- sary, after any of the above messages, and are preceded by the word "Tempête" (on 5,000 c.w.)
5,000 c.w.	—	—	W.	—	Stations: 01 Copenhagen 04 Blaavands Auk 02 Skagen 05 Hammeren 03 Hanstholm
Blaavand, OXB, 600 . . . request	—	—	W.	—	
Copenhagen, OXA, 600 sp. 1100 2100 request	—	—	W.	—	A summary of ice conditions in Danish waters, covering region of Cattegat and Baltic is transmitted <i>en clair</i> (English), during the winter months.
DOMINICAN REPUBLIC					
Santo Domingo City, M ₃ Y, 600 sp.	0306	0226 1141	S., U.W. American S., U.W. "		Surface ob., U.W. and weather reports pre- pared twice daily by Observation Squadron one, United States Marine Corps are sent in the American Code.
			W.	p.l.	Storm warnings are transmitted as soon as received, and every four hours afterwards, except at 0400
Santo Domingo	—	—	S.	—	Report prepared by the Aviation Service, USMC, twice daily
			W.	—	Storm warnings are transmitted as soon as received and every 4 hours afterwards, except at 0400.
EGYPT					
Cairo, Royal Air Force, GHK, 1,800 c.w.	0800	—	F.	p.l.	<i>En clair</i> forecast for Egypt and Palestine for 24 hours (i.e., from 0800-0800 G.M.T.)
	1030	See Stations	S.	N.I.C.	SYNOPTIC REPORTS. InIn BBBDD Fwwcb NOTES: (1) Late readings will be included in the broadcast for the following day prefixed by the group:—JJZZZ where JJ is the date of the readings. (2) These broadcasts are discontinued during the settled weather of the summer months, usually June to September, inclusive.
					Station. Time of ob. Station. Time of ob. G.M.T. G.M.T.
					02 Aboukir 0500 26 Limassol 0600
					03 Amman 0500 27 Suwa 0600
					05 Cairo 0500 28 Sollum 0600
					07 Abu Sueir 0500 29 Mersa-Matruh 0600
					11 Ramleh 0500 32 Qasr el Gebali 0600
					12 Baghdad 0500 33 Assuit 0600
					13 Mosul 0500 34 Aswan 0600
					14 Shaibah 0500 35 Port Said 0600
					18 Ramadi 0500 36 Suez 0600
					19 Kirkutt 0500 37 Tor 0600
					21 Malta 0700 38 Gaza 0600
					24 Candia 0600 39 Haifa 0600
					25 Athens 0700

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ESTHONIA					
Revel, AZA, 2,000 sp.	0805	0500	S. I.	O.I.C. mod.	SYNOPTIC REPORTS. In BBBDD FwTTW" b'b'b'RR MMmr Followed by Ice Report (see Hydrographic Section). In BBBDD FwTTW"
	2050	1100 1900	S.	"	NOTES: (1) b'b'b' = three-figure group indicating bar. tendency in tenths of mm. during preceding 3 hours. A falling bar. is indicated by adding 500 to this number. (2) W" = past weather in same code as for present weather W. Stations: 1 Revel, 2 Dorpot, 3 Filsand 4 Hungerburg.
FAROE ISLANDS					
Thorshavn, OXJ, 600 sp. ..	request	—	—	p.l.	Message containing a brief repetition of report published by Thorshavn Meteorological Institute.
FIJI ISLANDS					
Suva, VPD, 600 sp. (from May 1st-October 31st)	0930	2100	S.W.	special	<i>Form of message:—</i> (Name of Station). Barometer reading in inches to 3 dec. places if possible (corrected for height and to 32° F.); dry and wet bulb thermometer readings; direction and force of wind; state of sky (scale 0-10). <i>Example:—</i> 2990 78 76 SE5 10 <i>Meaning:—</i> Barometer—29.90 inches. Thermometer—dry bulb 78° F. wet bulb 76° F. Wind—"S.E. Force 5 (Beaufort Scale). Sky—Overcast. Stations: Apia (Samoa), Nukualofa (Tonga) Fila (New Hebrides), Norfolk Is., Suva. NOTE: Ob. at Fila taken at 2200 and 1000 G.M.T.
(From November 1st-April 30th during hurricane sea- son)	0200 0930	2100 0300	S.W. S.W.	" "	WR transmitted to Suva daily except Sunday from December 1st to April 1st. Message in- cludes height of bar. in inches to 3 dec. places direction of wind, wind force on Beaufort Scale and remarks on the state of the weather if unsettled.
The 0200 report is not sent on Saturdays, Sundays or holi- days					<i>Example of message:</i> Weather 29834 SE5 gusty and heavy rain <i>Meaning:</i> bar. = 29.834 inches; wind SE force 5, etc. Storm warnings are transmitted when necessary.
Lambasa, VPE ..	0300	—	S.	"	FINLAND Sandhamn, OJA, 5,500 c.w.
Taviuni, VPF, 600 sp. ..	2200	—	S.	"	
					SYNOPTIC REPORTS. "Météo Finland" InIn BBBDD FwwTT cbWVH ALA RRmmr "Pilot" InIn h,ddvv h,ddvv InIn BBBDD FwwTT cbWVH ALANh followed by ice report (see Hydrographic Section). InIn BBBDD FwwTT cbWVH ALA RRMMr NOTES: (1) In U.W. reports wind speed (vv) is given in metres per sec. (2) Storm warnings are also sent on request Stations:— 01 Helsingfors (C) 02, Sortavala (C) Kuopio (L), 04 Vaasa (C), 05 Sodan Kyla (C) 06 Kajaani (L).
	0855	0700	S.	N.I.C.	FRANCE Eiffel Tower (Paris), FL, 7,300 c.w. (2,600 sp. at 1005) [6,500 c.w. in case of break- down of main plant].
	1455	0700 1300	U.W. S.	" "	
	1955	1800	S.	"	
	0400	0100	S.	N.I.C.	INTERNATIONAL COLLECTIVE. "O.N.M." (1) "Météo Europe" InIn BBDDF w1TTK'R (2) "Navires" PQ"LLL MGG BBDDF
			O.	N.I.C. (mod.)	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
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(1)
FRANCE—contd.

(2)

(3)

(4)

(5)

(6)

1005

0700

S.

N.I.C.

O.

N.I.C.

(mod.)

S.

special

0100

1600

1300

—

—

2100

1800

—

—

NOTE Q"=Quarter of Globe in special code as follows:—

Code	Fig.	Lat.	Long.	Code	Fig.	Lat.	Long.
	1	N.	W.		5	N.	W.
	2	N.	E.		6	N.	E.
	3	S.	W.		7	S.	W.
	4	S.	E.		8	S.	E.

Bar. in mb. Temp. in ° F. Bar. in mb. or mm.; Temp. in ° C.

"O.N.M."
(1) "Météo Europe" InIn BBDDF
w₁TTK'R

(2) "Navires" PQ"LLL IIIIGG BBDDF
(3) "Météo Amérique" ddt
In (or InIn or InInIn) BBDDF ————

followed by the positions of the centres of highest and lowest barometric pressure in the following form:—

MAX, Name of Station en clair BBDDF, MIN
Name of Station en clair BBDDF

NOTES: (1) The American ob. are preceded by a four-figure group (ddtt), where dd=day of month, tt=hour of ob. G.M.T.

(2) In American ob.,
BB=Bar. pressure to nearest whole mm.
D=Direction of surface wind on scale 18—
(1=NE, 2=E, etc.)

(4) "Navires" [ob. from American ships in the Western N. Atlantic] InIn PQ"LLL IIIIGG BBDDF TITW

NOTES: (1) Q" has same meaning as in 0400 (2) message

(2) TTT is given to the nearest half degree C.

(3) W=present weather in O.I.C.

(4) Information relating to pressure maxima and minima may be added to the European ob. in the form—

MAX name of station BBDDF, name of station BBDDF

MIN name of station BBDDF, name of station BBDDF

These messages are sent in exactly the same form as 0400 message above

Stations: EUROPEAN (never more than 60 of the following are sent).

- | | | | | |
|-----------------|----------------|-------------------|-----------------|-----------------|
| 01 Paris | 18 Prague | 35 Rome | 52 Sofia | 69 Valladolid |
| 02 Madrid | 19 Ingoy | 36 London | 53 Bizerta | 70 Petrograd |
| 03 Vienna | 20 Seydisfjord | 37 Hamburg | 54 Tripoli | 71 Sevastopol |
| 04 Stockholm | 21 Kosice | 38 Bordeaux | 55 Agadir | 72 Canea |
| 05 Lerwick | 22 Genoa | 39 Brussels | 56 Athens | 73 Jan Mayen |
| 06 Lyons | 23 Lemberg | 40 Valencia | 57 Funchal | 74 Cordoba |
| 07 San Fernando | 24 Copenhagen | 41 Rabat | 58 Tangiers | 75 Orenbourg |
| 08 Munich | 25 Perpignan | 42 Lisbon | 59 Belgrade | 76 Venice |
| 09 Haparanda | 26 Lister | 43 Horta | 60 Pertusato | 77 Damascus |
| 10 Thorshavn | 27 Corunna | 44 Messina | 61 Florence | 78 Mygbugten |
| 11 Brest | 28 Ancona | 45 Reykjavik | 62 Corfu | 79 Muslimie |
| 12 Algiers | 29 Helsingfors | 46 Helwan | 63 Magdeburg | 80 Waigatch |
| 13 Warsaw | 30 Mahon | 47 Oran | 64 Barcelona | 81 Spitzbergen |
| 14 Bronnoy | 31 Budapest | 48 Cassel | 65 Moscow | 82 Astrakhan |
| 15 Renfrew | 32 Holyhead | 49 Malta | 66 Deir-es-Zoor | 83 Omsk |
| 16 Bucharest | 33 Zurich | 50 Constantinople | 67 Limassol | 84 Kiev |
| 17 Tunis | 34 Utrecht | 51 Taranto | 68 Malin Head | 85 Port Etienne |

NORTH AMERICAN.

- | | | | | |
|-------------------|---------------|----------------|--------------------|------------------|
| J St. John's N.F. | ED Edmonton | CR Little Rock | SLC Salt Lake City | DI San Diego |
| S Sydney N.S. | T Nantucket | NV Nashville | HL Helena | FW Fort Worth |
| FP Father Point | WA Washington | V Cleveland | DV Denver | EP El Paso |
| PN Parry Sound | H Hatteras | CH Chicago | RO Roseburg | JU Juneau |
| WR White River | C Charleston | DU Duluth | TAT Tatoosh | TN Tanana |
| WI Winnipeg | B Bermuda | HN Huron | SF San Francisco | DH Dutch Harbour |
| LP Le Pas | K Key West | | | |

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
FRANCE—contd.					FRENCH NATIONAL SYNOPTIC MESSAGES. (See special French Meteorological Code, page).
Eiffel Tower (Paris), FL, 7300 c.w. (6,500 c.w. in case of breakdown)	0220	0100	S.	N.I.C. (mod.)	(1) "Météo France" (01-49, except 04) InIn BBBTT cbbP DDFNV
		0100	U.W. O.	special N.I.C. (ships) mod.	(2) "Pilot" InInGG dfff dfff dfff, etc. (3) "Navires" PQ'LLL lllGG BBDDF wwvKd A ₁ n'a ₁ N ₁ w ₃ dsdsrsW ₃ TTcb ₁ b ₁ (For ships with index numbers above 49, the following code is used: InIn Q'LLLx ₁ Plllx ₂ BBDDx ₃ FVKdx ₄ wwGGx ₅ y ₁ y ₂ y ₃ y ₄ z)
	0820	0700	S.	N.I.C. (mod.)	NOTE.—(1) In ship reports, Q"=Quarter of globe in same code as for French International Collective message at 0400 G.M.T. q.v.
			U.W.	special	(2) S=Time of cessation of precipitation on same scale as time for commencement in N.I.C. (0=no rain or rain still falling).
			S.	N.I.C.	dsds=Ship's course on scale 01-32 (0S = from East).
			O.	N.I.C. (ships)	W ₃ =Weather during the last hour in same code as W ₃ (see French Meteorological Code).
	1420	1300	S.	N.I.C. (mod.)	(1) "Météo France" (01-49, except 04) InIn BBBTT cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ mmRRd
			U.W.	special	(2) "Pilot" same form as Part (2) of 0220 message above
			S.	N.I.C.	(3) "Météo Suisse Belgique, Hollande" (04 and 51-64) InIn BBBDD FwwTT cbWVH ALaNH RRmmr C ₁ ddVV
			O.	N.I.C. (ships)	(4) "Navires" same form as part (3) of 0220 message.
	1920	1800	S.	N.I.C. (mod.)	NOTE.—(1) F ¹ =Speed of lowest cloud, where speed in metres per sec. is equal to 4F ¹ —2 and F ¹ =figure reported, but 0=no ob. and 9 means "greater than" 32 metres per sec.
			U.W.	special	"Météo France" (01-49, except 04)
			S.	N.I.C.	(1) InIn BBBTT cbb (SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ MMt ₂ t ₂ d
			O.	N.I.C. (ships)	(2) "Pilot" same form as part (2) of 0220 message
			S.	N.I.C.	(3) "Météo Suisse, Belgique, Hollande" same form as Part (3) of 0820 message
			O.	N.I.C. (ships)	(4) "Navires" same form as Part (3) of 0220 message

NOTES: (1) t₂t₂=Depression of wet bulb
below the dry in tenths of a degree C. When
the depression is 10 degrees or above, the word
"sec." is added at the end of the message,
denoting that 10 degrees must be added to the
value given by t₂t₂

(2) The letter "x" used to denote
missing ob.

(3) When there is no cloud below 2,500 m
the group ddF'nh is omitted entirely

FRANCE—cont'd.

STATIONS.—(Stations in capitals are those usually sent).

01 ROCHEFORT (C)	16 Perpignan (C)	31 MARIGNANE (C)	45 Le Puy
02 BAYONNE (C)	17 Lorient (C)	32 Metz (L)	46 Puy-de-Dôme (L)
03 BORDEAUX (C)	18 RENNES (L)	33 Montélimar (L)	47 Pic-du-Midi (L)
04 BRUSSELS (L)	19 STRASBOURG (L)	34 ROMILLY (L)	48 Mont-Ventouse (L)
05 Cherbourg (C)	20 TOULON (C)	35 Valenciennes (L)	49 Mont-Aigoul (L)
06 Clermont-Ferrand (L)	21 TOULOUSE (L)	36 ABBEVILLE (L)	51 ZURICH (L)
07 DIJON (L)	22 TOURS (L)	37 NANCY (L)	52 BERNE (L)
08 ST. INGLEVERT (C)	23 Antibes (C)	38 Saint Dizier (L)	53 GENEVA (L)
09 Limoges (L)	24 Pontarlier (L)	39 Epinal (L)	54 LUGANO (L)
10 LYONS (L)	25 St. Raphael (C)	40 Mulhouse (L)	55 SAENTIS (L)
11 BREST (C)	26 AJACCIO (C)	41 Avord (L)	61 DEBILT (L)
12 Nîmes (L)	27 ARGENTAN (L)	42 Angoulême (L)	63 HELDER (C)
13 MAYENCE (L)	28 Amiens (L)	43 Orleans (L)	63 FLUSHING (C)
14 Montpellier (L)	29 Cosne (L)	44 Poitiers (L)	64 Groningen (L)
15 LE BOURGET (L)	30 HAVRE (C)		

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4) W.	(5) p.l.	(6) Storm Signals are added to any of the above messages when the forecasts show the wind to exceed 50 ft. (15 m.) per sec. = Force 7 on the Beaufort scale.

For the purpose of these signals the coasts of France have been divided into the following areas:—

“Manche.”—From the Belgian frontier to the parallel of St. Helier.

“Bretagne.”—From the parallel of St. Helier to (and including) Noirmoutiers.

“Océan.”—From Noirmoutiers to the Spanish frontier.

“Roussillon.”—From the Spanish frontier to Faraman.

“Provence.”—From (and including) Faraman to the Italian frontier (including Corsica).

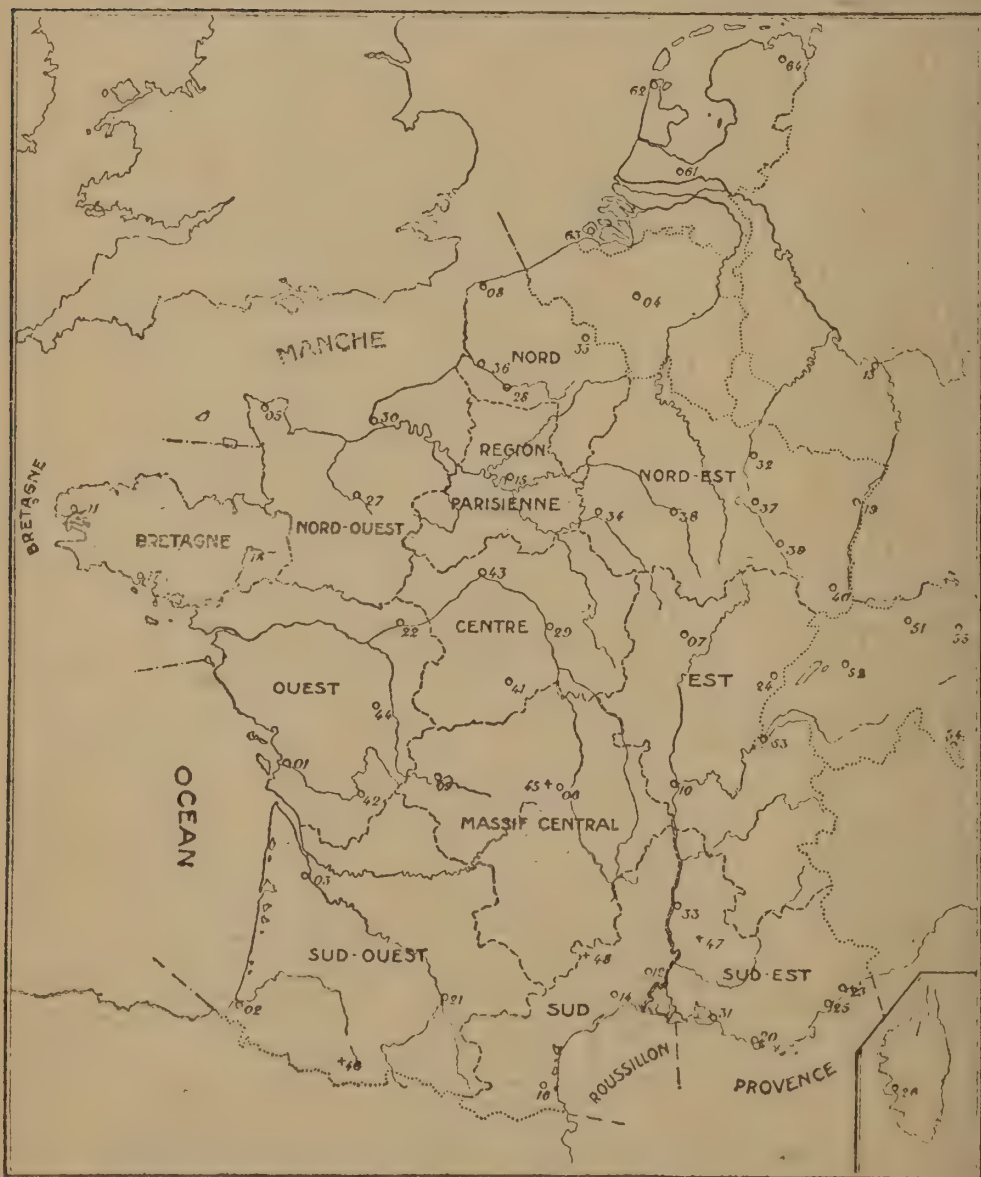
“Méditerranée.”—This is only used when it is feasible to send one message covering the areas “Roussillon” and “Provence.”

FORM OF MESSAGE.—The message is sent *en clair*. It commences with the name of the day of the week, the duration of time for which the warning is valid, followed by the word “Tempête,” and the probable direction from which the gale may be expected.

Le Bourget (Paris), 1,680 c.w.	0550	0100	S. O.	N.I.C. ”	Repeat of 0400 message from Eiffel Tower “International Collective” above.
Le Bourget (Paris), FNB, 1,680 c.w.	0328†	0300	S.	N.I.C.	AVIATION SYNOPSIS MESSAGES. “Météo Phisérar” [0300] (1) “PLBA” xInIn (Vs) wwVhL NDDFW (2) GG25 xInIn wwVhL. NOTES: (1) † means sent during summer months only. (2) x is a check figure, and is the units digit in the sum of the figures wwVhL [0400] (1) “PLBA” InIn (Vs) BBBDD FwwTT cbWVH ALaNH CaddF ₁ S (2) Same form as Part (2) of 0328 message. [0500] (1) “PLBA” x InIn (Vs) wwVhL NDDFW (2) “Pilot” InIn h ₁ ddVV h ₁ ddVV, etc. (3) Same form as Part (2) of 0328 message (4) Ob. at stations on aerial routes other than Paris-London, Brussels-Amsterdam in special code [0600] (1) Same form as Parts (1), (2) and (4) of 0528 message [0700] (1) “PLBA” (15, 08 and 35) InIn (Vs) BBBDD FwwTT cbWVH ALaNH CaddF ₁ S (36, 53, 54, 30) x InIn (Vs) wwVhL NDDFW CaddF ₁ S (2) Same form as Part (2) of 0328 message (3) Same form as Part (4) of 0528 message Same form as 0628 message Same form as Parts (1), (2) and (3) of 0528 message
	0128†	0400	S.	N.I.C.	
	0528†	0500	S. U.W. S.	N.I.C. ” ”	
	0628	0600	S. U.W.	N.I.C.	
	0728	0700	S.	N.I.C.	
	0828	0800	S.	N.I.C.	
	0928	0900	S. U.W.	N.I.C. ”	

† These messages are dis-continued during the winter months.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) FRANCE — <i>cont'd.</i>	(2)	(3)	(4)	(5)	(6)
	1028	1000	S.	N.I.C.	Same form as 0728 message
	1128	1100	S.	N.I.C.	Same form as 0628 message
	1228	1200	S. U.W.	N.I.C. "	Same form as 0528 message
	1328	1300	S.	N.I.C.	[1300] (1) " PLBA " (15, 08, 35, 30) InIn(Vs) BBBDD FwwTT cbWVH ALANh CaddF,S (36, 53, 54) xInIn (Vs) wwVhL NDDFW CaddF,S
	1428	1400	S.	N.I.C.	(2) Same form as Part (2) of 0328 message
	1528	1500	S.	"	(3) Same form as Part (4) of 0528 message
	1628	1600	S.	N.I.C.	Same form as 0628 message
	0750 1050 1250 1750	—	F.	p.l.	Same form as 0728 message Forecasts for London-Paris-Brussels-Stras- bourg aerial routes <i>en clair</i>



Forecast regions and Coastal areas of France. The index numbers refer to stations appearing in the Synoptic Reports issued from the Eiffel Tower.

RANCE *contd.*

ATIONS: 15 Le Bourget, 08 Calais (St. Inglevert), 36 Abbeville, 35 Valenciennes, 30 Le Havre, 53 Beauvais, 54 Compiègne.

PRECASTS: These give the probable *changes* with reference to the actual weather given in the last hourly message. They are given in plain language under four different headings, each commencing with the letters AL, followed by one of the letters A, B, C or D. Thus:—

After the letters ALA follows information as to state of sky, height of cloud, precipitation

After the letters ALB follows information as to wind at surface

After the letters ALC follows information as to wind at 1,000 m. (3,000 ft.)

After the letters ALD follows information as to visibility

The forecasts are given for different areas, the different parts commencing with the letters PARS

Index	Region	Index	Region
PARSA	Paris to Abbeville	PARSC	Paris to Noyon
PARSB	Abbeville to English Coast	PARSD	Noyon to Brussels

The letters PARS may be followed by one or by several letters, e.g., PARSABC, indicating that the following sentence refers to the three districts A, B and C

When no change is anticipated in any particular division the word "NIL" is sent

The indices PARSE to PARSL relate to aerial routes from Paris other than to London, Brussels and Amsterdam

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of obs. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Nantes (Basse-Lande), UA, 2,800 sp.	1230	—	S. F.	p.l. p.l.	Broadcasts <i>en clair</i> (French) the general meteorological situation over North America, the Atlantic and Western Europe, together with a forecast for the benefit of shipping
Cherbourg FUC	See notes	—	W.	p.l.	Storm warnings preceded by the International Safety Signal as soon as received by land line or by W/T from the Eiffel Tower. The storm signal is repeated three times at intervals of 10 minutes Cherbourg, Brest, Lorient and Rochefort transmit signals concerning the areas Manche, Bretagne and Océan; Porquerolles and Ajaccio transmit signals concerning the areas Roussillon and the Mediterranean. When the time of sending falls outside the watch kept by ships carrying a single operator the message is repeated at the commencement of the succeeding watch
Brest FUE					
Lorient FUN					
Rochefort FUR					
Porquerolles FUQ					
Ajaccio FUI					
All 600 sp.					
Eiffel Tower, 2,600 R/T ..	0640*	—	F.	p.l.	FORECASTS FOR AGRICULTURE, AERIAL ROUTES, ETC. (Transmitted by Radiotelephony). Forecasts for certain specified areas (see maps and notes) in France, valid during the day, and advices for aerial routes
These messages are not transmitted on Sundays	1115*	—	F.	p.l.	Forecasts for areas (valid during the afternoon), the actual state of the weather (at 0700), and changes in general atmospheric pressure; forecasts of wind for the coastal areas (valid during the afternoon and night until 7 a.m.); warnings of storms on the coasts
	1900	—	F.	p.l.	Forecasts for areas valid for the night and the morning of the following day
	2210*	—	F.	p.l.	Actual state of the weather at 1800, and probable changes in the general atmospheric situation; forecasts of wind for the coastal areas (valid during the following day up to 6 p.m.) and warnings of storms

FRANCE—*contd.*

NOTES: (1) Messages begin: "Voici les prévisions agricoles de l'Office National Météorologique pour la nuit du au et la journée du" or "Voici les prévisions agricoles de l'Office National Météorologique pour la journée du"

(2) The meteorological elements predicted are given below and are transmitted in the order indicated:—

Elements predicted.	Given in one or more of the undermentioned terms.	Elements predicted.	Given in one or more of the undermentioned terms.
(a) General prevailing situation	<i>e.g.</i> temps chaud temps orageux temps froid temps pluvieux temps à averses et éclaircies temps brumeux temps neigeux	(d) Rainfall expected	<i>e.g.</i> pluies averses neiges
(b) Wind (i) direction (<i>i.e.</i> , direction from which winds blow) (ii) force	<i>e.g.</i> nord, nord-est, est, sud-est, etc. <i>e.g.</i> faible, modéré, fort, très fort	(e) Temperature— (i) probable minimum temperature during the night (1900 message) (ii) probable maximum reached during the day (0640 message) (iii) indication of changes	a number <i>e.g.</i> en hausse, en baisse ou stationnaire
(c) State of the sky (amount of sky covered with cloud)	<i>e.g.</i> pur (none or very few clouds), nuageux (sky half covered), très nuageux (sky three-quarters covered), couvert (sky completely covered)	(f) Other information endangering crops	<i>e.g.</i> gelées, orages, grêle, tempêtes, brouillard

(3) The above information is given for the following regions in the order indicated:—

"Voici les prévisions agricoles pour la région"

1. Nord. (Aisne, Nord, Pas-de-Calais, Somme).
2. Bretagne. (Côtes-du-Nord, Finistère, Ille-et-Vilaine, Morbihan).
3. Nord-Ouest. (Calvados, Eure, Mayenne, Manche, Orne, Sarthe, Seine-Inférieure).
4. Parisienne. (Eure-et-Loir, Oise, Seine, Seine-et-Marne, Seine-et-Oise).
5. Nord-est. (Aube, Ardennes, Bas-Rhin, Haut-Rhin, Haute-Marne, Marne, Meuse, Meurthe-et-Moselle, Moselle, Vosges).
6. Ouest. (Charente, Charente-Inférieure, Deux-Sèvres, Indre-et-Loire, Loire-Inférieure, Maine-et-Loire, Vendée, Vienne).
7. Centre. (Cher, Indre, Loiret, Loir-et-Cher, Nièvre, Yonne).

8. Est. (Ain, Côte-d'Or, Doubs, Haute-Saône, Hautes-Alpes, Haute-Savoie, Isère, Jura, Rhône, Saône-et-Loire, Savoie).
9. Massif-Central. (Allier, Aveyron, Cantal, Corrèze, Creuse, Haute-Loire, Haute-Vienne, Loire, Lozère, Puy-de-Dôme).
10. Sud-Ouest. (Ariège, Basse-Pyrénées, Dordogne, Gers, Gironde, Haute-Garonne, Haute-Pyrénées, Landes, Lot, Lot-et-Garonne, Tarn-et-Garonne).
11. Sud. (Ardèche, Aude, Gard, Hérault, Pyrénées-Orientales).
12. Sud-Est. (Alpes-Maritimes, Basses-Alpes, Bouches-du-Rhône, Drôme, Var, Vaucluse).

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of obs. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
FRENCH INDO CHINA					
Mitho, FCA, 600 normal (or 2,000)	0400 1800 request	— — —	S.W. S.W. S.W.	p.l. p.l. p.l.	<i>En clair</i> message followed by typhoon warnings (when necessary) The weather report and typhoon warnings issued by Haifong ob. is also sent on request
Tourane, FLT, 300 normal (1800)	request	—	S.W.	p.l.	Do. do. do. do.
Hanoi, FAO, 600 sp. ..	0230	—	—	—	—
Kien An, FKA, 1,200 sp. ..	0210	2300	S.	N.I.C.	(1) BEBDDFS Stations: (in the order given) Fung-Tien-Sha, Cape St. James, Kwang-chau. NOTE: When ob. of a station are missing a group of cyphers is transmitted in their place

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ENCH INDO CHINA —ontd.	0210	—	W.	special	<p>(2) "Typhon" LL11D₁D₁K or "Coup de Vent" D₁D₁Q, followed by the control number of the previous group in full.</p> <p>NOTES: LL = Latitude (given in whole degrees) of the centre of the typhoon.</p> <p>ll = Longitude ditto.</p> <p>D₁D₁ = Forecast of the direction the typhoon (or storm) is likely to travel. The same as DD in the New International Code, with the following additions:—</p> <p>51—In formation. 54—Stationary, or very slow.</p> <p>52—Two centres. 56—Turning.</p> <p>53—Direction unknown. 58—Filling up.</p>

K = Radius and force.

- 1— ± 120 miles; intensity unknown.
- 2— ± 120 miles; intensity violent.
- 3— ± 60 miles; intensity unknown.
- 4— ± 60 miles; intensity violent.
- 5—Increasing.
- 6— ± 30 miles; intensity unknown.
- 7— ± 30 miles; intensity violent.
- 8—Exceptional velocity.
- 9—Continental depression.
- 0—Position unknown.

Q = Area threatened.

1—Coast of Anam.

- 2—Gulf of Tongking and Swatow.
- 3—Formosa channel.
- 4—Formosa to Yangtse.
- 5—Yangtse to Shantung.
- 6—Gulf of Pechili to Gulf of Yalu.
- 7—Sea of Japan.
- 8—North of Hokkaido.
- 9—East coast of Japan.
- 0—South Kyushu.

(Warnings are also broadcasted at times other than that given in the schedule.)

(1)	(2)	(3)	(4)	(5)	(6)
ERMANY					INTERNATIONAL COLLECTIVE REPORTS.
Snigswusterhausen, LP, 5,700 c.w.	0650	0100	S.	N.I.C.	<p>(1) "Funkobs Nacht" (Ob. from Hamburg, Great Britain, Poland and France) InIn BBBDD Fw₁w₁TT cbWVH</p>
		1800 (previous day)	S.	N.I.C.	<p>(2) "Nachtrag" (Ob. from Prague, Budapest, Spain, Italy, North Africa) InIn BBBDD Fw₁w₁TT cbWVH ALaNR</p>
		—	O.	N.I.C. (mod.)	<p>(3) Ship ob. from the Atlantic, preceded by "Dampfer or Schiff," are sometimes added in the following code. (See Notes 3 and 4 below). PQ₁LLL 11ZZ BBDDF wwvKd TTtC</p>
	0850	0700	S.	N.I.C.	<p>(1) "Funkobs I" (Ob. from Holland, Denmark, Sweden, Norway, Great Britain, Iceland, Estonia, Poland, France, Switzerland, Belgrade, Bucharest, Sofia, Athens, Finland) InIn BBBDD Fw₁w₁TT cbWVH ALaNR</p>
		—	O.	N.I.C. (mod.)	<p>(2) As for (3) in 0650 message</p>
	1150	1300	S.	N.I.C.	<p>(1) "Funkobs II" (Ob. from Holland, Denmark, Sweden, Norway, Great Britain, Iceland, Poland, France, Switzerland, Belgrade, Bucharest, Sofia, Finland, Russia) InIn BBBDD Fw₁w₁TT cbWVH ALaNH</p>
		0700	S.	N.I.C.	<p>(2) "Nachtrag" (Ob. from Prague, Budapest, Spain, North Africa, Horta) InIn BBBDD Fw₁w₁TT cbWVH ALaNR</p>
		—	O.	N.I.C. (mod.)	<p>(3) As for (3) in 0650 message</p>
	1950	1800	S.	N.I.C.	<p>(1) "Funkobs III" (Ob. from Holland, Denmark, Sweden, Norway, Great Britain, Iceland, Poland, France, Switzerland, Belgrade, Bucharest, Sofia, Finland) InIn BBBDD Fw₁w₁TT cbWVH ALaNR</p>
		1300	S.	N.I.C.	<p>(2) "Nachtrag" (Ob. from Prague, Budapest, Spain, North Africa) InIn BBBDD Fw₁w₁TT cbWVH ALaNH</p>
		—	S.	N.I.C. (mod.)	<p>(3) As for (3) in 0650 message</p>

GERMANY—*contd.*

NOTES: (1) In the case of stations marked thus * in the list below, the following code is used:—

(a) For 0700 G.M.T. ob., $I_n I_n BBBDD FwTT \beta bbRR$

(b) Ob. at other times, $I_n I_n BBBDD FwTT \beta bb$

These symbols have the meaning of the O.I.C. (q.v.)

(2) When ob. from any stations in the list are missing, ob. from neighbouring stations are included in the messages, with the station *names en clair*.

(3) The time of ob. is indicated in the messages by *prefixing* two figures (giving the hour of the ob.) to the index number of the first station observing at this time, *e.g.*, the group 0801 means that the ob. at station 01 and the following stations were made at 0800. Central European time is used throughout these messages; *subtract* one hour to obtain G.M.T.

(4) A Special Code Group is added to Ship Reports:—

Q¹ is the quarter of the globe; 1 = Lat. N., Long. W.; 2 = Lat. N., Long. E.; 3 = Lat. S., Long. W.; 4 = Lat. S., Long. E.; ZZ = hour of ob. (Central European Time)

STATIONS:—

01 Borkum	18 Brocken	34 Kinn	50 Vestmanna	66*Sofia
02 Keitum	19 Fichtelberg	35 Björnöya	51*Riga	67 Helsingfors
03 Hamburg	20 Vienna	36 Röst	52 Warsaw	68 Sortavala
04 Swinemünde	21 Helder	37 Jan Mayen	53 Lemberg	75 Prague
05 Danzig	22 Flushing	38 Utsire	54 Pinsk	76*Budapest
06 Memel	23 Copenhagen	39 Lerwick	55 Rochefort	77 Madrid
07 Aachen	24 Skagen	40 Scilly	56 Bayonne	78 Corunna
08 Cassel	25 Hanstholm	41 Tynemouth	57 Clermont	79 Mahon
09 Berlin-Steglitz	26 Haparanda	42 Valencia	58 Dijon	80*Venice
10 Dresden	27 Härnosand	43 Stornoway	59 Brest	81*Rome
11 Breslau	28 Karlstad	44 Holyhead	60 Paris	82*Messina
12 Frankfurt	29 Stockholm	45 Yarmouth	61 Perpignan	83 Rabat
13 Karlsruhe	30 Wisby	46 Blacksod	62 Toulon	84 Oran
14 Munich	31 Spitzbergen	47 Calshot	63 Zürich	85 Bizerta
16 Zugspitze	32 Ingöy	48 Thorshavn	64 Lugano	86 Horta
17 Kahler Asten	33 Valdersund	49 Seydisfjord	65 Belgrade	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Königswusterhausen, LP, 5700 c.w.	0840	0700	S.	N.I.C.	SYNOPTIC REPORTS (1) "Obs. Deutschland" $I_n I_n BBBB$ $Fw, w, TT cbWVH ALAnH RRmmr$ (2) Followed by Ice Report (winter mon only). See Hydrographic Section. (1) "Obs. Deutschland" $I_n I_n BBBB$ $Fw, w, TT cbWVH ALAnH$ (1) Same form as Part (1) of 0840 mess. NOTES: (1) For the following high le stations, the bar. pressure is <i>not</i> reduced sea level. The normal limits for the readi are: Zugspitze 490-553 mm.; Kahler Ast 648-718 mm.; Brocken, 624-690 mm Fichtelberg, 618-685 mm. STATIONS: Same as for International Collect Reports, stations 01-20 inclusive only
Königswusterhausen, LP, 5700 c.w. (When transmission can- not be made from LP, they are transmitted by Linden- berg (call LI, wavelength 900 c.w.) about 0700, 0920, 1620, 2020 G.M.T.)	0635	0500	S.	O.I.C. (mod.) Linden- berg " " F. p.l.	LINDENBERG AEROLOGICAL REPORT (Upper Air Reports). " Nachrichten für Luftfahrer, Lindenberg (station name <i>en clair</i>) BBBDD $FwTTV_1$ (Station, <i>en clair</i>) HHDDF HHDDF, c addf ZZWVc (Station, <i>en clair</i>) HHTTT PPDDF HHT PPDDF, etc., ZZWVc Summary of flying conditions, <i>i.e.</i> , up wind, cloud, etc., with forecast for Cen Germany <i>en clair</i> Exactly the same as for 0635 message ab NOTES: (1) V = horizontal visibility NIC (2) addf is a nephoscope group, and identified by its containing only four fig (3) The stations usually reported Lindenberg, Hamburg, Aachen, Bremen
	0905	—			
	1505	—			
	2005	—			

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GERMANY— <i>contd.</i>					
Stuttgart	0820	—	U.W. U.A.T.	Linden- berg	HHDDF HHDDF, etc., ZZWVc HTTTT PPDDF HTTTT PPDDF, etc., ZZWVc Station: Friedrichshafen (1) BBBDD FwTTH cbbRR MMmmW" V
Breslau	0755	0700	S.	German Met.	(2) "Pilot" HHDDF HHDDF HHDDF, etc., addf ZZWVc BBBDD FwTTW'" cbbHA ₂
	1420	1300	S.	German Met.	BBBDD FwTTW' cbb BBBDD FwTTH cbbRR MMmmW" m ₃ m ₃ m ₃ V
Berlin	1855	1800	S.	"	BBBDD FwTTW'" cbbHA ₂
	0745	0700	S.	"	BBBDD FwTTW' cbb
	1345	1300	S.	"	BBBDD FwTTW'" cbbHA ₂
	1845	1800	S.	"	BBBDD FwTTW' cbb

Note on German Meteorological Code.

For the purposes of these reports, the code letters of the German Met. Code have the same meaning as in the New International Code with the following exceptions:—

- | | | | |
|------------------------|--------------------------------|----------------------------------|------------------------------|
| 1 = Cloud form | 2 = Cirro-stratus | 5 = Stratus and Strato-cumulus | 8 = Uniform heavy sky |
| 0 = Cloudless blue sky | 3 = Cirro-cumulus | 6 = Dull, small patches of cloud | 9 = Cloudless, dark blue sky |
| 1 = Cirrus | 4 = Cumulus and cumulo-stratus | 7 = Several layers of cloud | |

m₃m₃m₃ = Grass minimum temp. in tenths of degree C.

W¹ = Characteristic of past weather

0 = Mainly fine

1 = fair (high clouds preponderating)

2 = mainly overcast (low clouds preponderating)

3 = Sheet lightning (more than one flash)

4 = Precipitation, mainly during forenoon, without thunderstorms

5 = Precipitation, mainly during afternoon, without thunderstorms

6 = mainly foggy

7 = Thunderstorm

8 = Passing showers (squally, changeable weather with bright intervals)

9 = Persistent precipitation—general rain throughout the country

W" = Past weather—This is the same as W' above, except that 6 signifies "precipitation mainly during the night" instead of "mainly foggy"

W'" = Past weather—This is the same as W' above, except that code figures 4, 5 and 6 have the following special meanings:—

4 = Slight precipitation

5 = Heavy rain

6 = Heavy snowfall

w = State of Sky

0 = Sky cloudless

1 = Sky quarter covered

2 = Sky half covered

3 = Sky three-quarters covered

4 = Sky overcast

5 = Rain

6 = Snow

7 = Mist

8 = Fog

9 = Thunderstorm

(1)	(2)	(3)	(4)	(5)	(6)
BALTIC COAST					SYNOPTIC REPORTS.
Friedrichsort, KBK, 720 sp.	0710	0700	S.	German Met.	BBBDD FwTTH VS
	1010	1000	S.	"	Stations, Bülk and Marienleuchte (Fehmarn)
	1310	1300	S.	"	
	1615	1600	S.	"	
600 sp.	1810	1800	S.	"	
	1100	—	S ₁ F.	p.l.	Statement <i>en clair</i> (German) of atmospheric pressure over Europe and forecast for the Western Baltic
	request	—	—	—	NOTE: At the request of ships, and on payment of a charge, weather reports not exceeding 25 words will be transmitted containing a general review of the meteorological conditions and the latest forecast for the Western Baltic
					(1) BBBDD FwTTH cbbRR MMmmW"
					(2) "Pilot" HHDDF HHDDF, etc., addf ZZWVc
					Repeat of 1000 and 1600 messages from Adlergrund Light Vessel
					BBBDD FwTTW'" cbbHA ₂
					BBBDD FwTTW' cbb—followed by repeat of 1800 message from Adlergrund Light Vessel
Swinemünde, KAW, 1,000 sp.	0725	0700	S.	German Met.	
			U.W.	Linden- berg	
	1145	1100	S.	German Met.	
	1645	1600	S.	"	
	1325	1300	S.	"	
	1825	1800	S.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GERMANY—contd.					
Swinemünde, KAW, 600 sp. and R/T	1030 2145	0700 1800	F.W. F.W.	p.l. "	"Funkwetter" <i>En clair</i> message (German), giving a general review of the weather at Bülk, Adlergrund, Skagen and Visby, and forecast for Western and Middle Baltic Storm warnings preceded by the word "Funksturm" [These messages are afterwards repeated at 1800 metres R/T] Weather reports and forecasts also issued on request
Adlergrund Light Vessel, KAG, 300 sp.	request 0700 1000 1600 1800	— — — —	F. S. S. S.	p.l. " " "	<i>En clair</i> messages (German) giving wind direction and force, state of sky and sea visibility, air and sea temperatures
Pillau, KAP, 600 sp.	0730 1330 1830 1130	0700 1300 1800 0700	S. S. S. S.	N.I.C. " " p.l.	SYNOPTIC REPORTS. BBBDD FwTTS Stations: Pillau and Brusterort Surface ob. at Pillau, Brusterort, Memel and Visby General review of the weather and forecast for the Eastern Baltic
Königsberg, KO, 2,200 c.w.	0805 1030 1905	0700 — 1800	S. F.W. S.	German Met. p.l. German Met.	(1) BBBDD FwTTH cbbRR MMmmW" (2) "Pilot" HHDDF HHDDF, etc. followed by a repeat of the Reval 0720 of addf ZZwVc Stations: Königsberg and Memel <i>En clair</i> message, consisting of forecast and warnings for the Eastern Baltic BBBDD FwTTW' cbb Stations: Königsberg and Memel
NORTH SEA COAST.					
Borkum, KBM, 1,250 sp.	0715 1100 1315 1815	0700 1000 1300 1600 1800	S. S. S. S. S.	N.I.C. (mod.) " " " "	SYNOPTIC REPORTS. BBBDD FwTTH cbbRR MMmmS (Ob. from Borkum and Borkum Riff Lt. V.) BBBDD FwTT cbb (Ob. from Borkum Valencia (50), Plymouth (72), Calshot (74)) BBBDD FwTTW' cbbHA ₂ (Ob. from Borkum and Borkum Riff Lt. V.) BBBDD FwTT cbb } (Ob. from Borkum BBBDD FwTTW' cbb } and Borkum Riff Lt. V.)
Borkum Riff Light Vessel, KBR, 300 sp.	0710 1310 1810	0700 1300 1800	S. S. S.	N.I.C. (mod.) " "	SYNOPTIC REPORTS. BBBDD FwTT cbbRR S ttt BBBDD FwTTW' cbbS ttt BBBDD FwTTS cbb ttt
Cuxhaven, KCX, 600 sp.	request	0900	S.W.	p.l.	<i>En clair</i> message prepared by the German Sea ob. at Hamburg, including forecast for the North Sea and storm warnings
List, KAL, 1,250	0150 0500 0710 1040 1310 1610 1810 2220		S.	p.l.	<i>En clair</i> message, giving direction and force of wind, state of sky and sea off Sylt, observed at the even hour preceding the time of transmission
NORTH SEA COAST—contd.					
Amrum Bank Light Vessel, KAF, 300 sp.	0705 1305 1805	0700 1300 1745	S. S. S.	p.l. " "	<i>En clair</i> message; wind direction and force, state of the sea, visibility and state of sky followed by air and sea temperatures
Norddeich, KAV, 600 sp., 1,800 R/T	1015 2130	0700 1800	S.F. S.F. W.	p.l. " "	Message consists of— (1) Surface ob. <i>en clair</i> from Borkum Riff Light Vessel, Amrum Riff Light Vessel, Utsi and Tynemouth (2) General review of weather and pressure distribution. (3) Twelve hours' forecast for the North Sea (4) Storm warnings for the North Sea

NOTES : (1) The alternative stations in col. (2) in the list of stations below are only used when the information from the corresponding station in col. (1) is missing. If, in such a case, more than one alternative station is available, the first is taken ; with the exception that *all* the available Italian observations for 0700 are sent in the 1450 message

(2) For stations thus marked X, the ob. sent in the 0850 message relate to 1800 G.M.T. of the previous day, and those in the 1450 message to 0700 G.M.T. of the same day

(3) Reports from Icelandic stations are *occasionally* added to these messages in same code as for British Synoptic Reports (q.v.)

(4) For "Horta," pressure is in mb. and minimum temp. in degrees F.

Column (1)

Column (1)		Column (2)	Column (1)	Column (2)
01	Jan Mayen	33 Bjornoya	18 Mainz	64 Strasbourg
		34 Spitzbergen		65 Metz
02	Ingoy	35 Vardo	19 Marignane	66 Toulon
		36 Abisko		67 Le Havre
03	Bromoy	37 Rost	20 Zurich	68 Bern
		38 Valdersund		69 Geneva
04	Lister	39 Utsire	21 Corunna x	70 Madrid x
		40 Okso		71 Valladolid x
05	Kinn	41 Bergen	22 Horta x	72 Ponta Delgada x
		42 Faerder		73 Funchal x *
06	Haparanda	43 Stensele	23 Berlin x	74 Hamburg x
		44 Harnosand		75 Swinemunde x
07	Stockholm	45 Ostersund	24 Munich	76 Vienna *
		46 Wisby		77 Linz x *
08	Copenhagen	47 Karlstad		78 Innsbruck x *
		48 Sarna	25 Warsaw	79 Lemberg
09	Blaavands Huk	49 Hammeren		80 Lodz x
		50 Hanstholm		81 Cracow x
		51 Skagen	26 Posen	82 Tarnow
10	Helder			83 Lublin x
11	Flushing	52 De Bilt		84 Pinsk x
		53 The Hague	27 Prague	85 Kosice
12	Brussels			86 Cheb x
13	Paris	54 Amiens		87 Stara Dala x
		55 Romilly	28 Genoa x *	88 Leghorn x *
14	Brest	56 St. Mathieu		89 Florence x *
		57 Ushant	29 Rome x *	90 Taranto x *
15	Rochefort	58 Ile d'Aix		91 Pesaro x
		59 Toulouse	30 Malta x	92 Palermo x *
16	Bayonne	60 Bordeaux		93 Cagliari x *
		61 Cherbourg	31 Helwan x	94 Limassol x *
17	Lyons	62 Dijon	32 Gibraltar	95 Lisbon x
		63 Valenciennes		

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) GREAT BRITAIN—<i>contd.</i>	(2)	(3)	(4)	(5)	(6)
Air Ministry (London), GFA, 4,100 c.w.	0200	0100	S.	N.I.C.	BRITISH AND ICELANDIC SYNOPTIC. (1) (or-78) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (2) "Pilot" InIn h ₁ ddvv h ₁ ddvv, etc. (3) "Temp" InIn YYGG BBTH BBTH, etc. (4) "Ships" InIn QLLX ₁ Illx ₂ BBDDx ₂ FvKdx ₁ wwGGx ₂ TTtx ₃ CNWrx ₄ y ₁ y ₂ y ₃ y ₄ z ₅ (1) (or-78) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (2) "Horta" BBBDD FwwTT cbWVH CN --- (3) "Pilot" as for Part (2) of 0200 message (4) "Temp" as for Part (3) of 0200 message (5) "Ships" repeat of Part (4) of 0200 message, together with all reports from British ships for the past 23 hours, which, owing to limitation of the length of messages, were not issued in the 0800, 1400 and 1900 messages of the preceding day (1) (or-78) InIn BBBDD FwwTT cbWVH ALaNH RRmmr C ₁ ddVV (for Inland Stations) (or-78) InIn BBBDD FwwTT cbWVH ALaNH RRSVsr C ₁ ddVV (for Coastal Stations) (91 and 95) InIn BBcbb BBBDD FwwTT cbWVH ALaNH RR --- r (92, 93, 94, 96) InIn BBcbb BBBDD FwwTT cbWAN (2) Same form as Part (2) of 0200 message (3) Same form as Part (3) of 0200 message (4) Same form as Part (4) of 0200 message (1) (or-78) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (91 and 95) InIn BBBDD FwwTT cbWVH ALaNH C ₁ ddVV (92, 93, 94, 96) InIn BBBDD FwwTT cbWAN (3) Same form as Part (2) of 0200 message (3) Same form as Part (3) of 0200 message (4) Same form as Part (4) of 0200 message (1) (or-78) InIn BBBDD FwwTT cbWVH ALaNH RRmmr C ₁ ddVV (for Inland Stations) (or-78) InIn BBBDD FwwTT cbWVH ALaNH RRSVsr C ₁ ddVV (for Coastal Stations) (91 and 95) InIn BBBDD FwwTT cbWVH ALaNH RR --- r C ₁ ddVV (92, 93, 94, 96) InIn BBBDD FwwTT cbWAN (2) Same form as Part (2) of 0200 message (3) Same form as Part (3) of 0200 message (4) Same form as Part (4) of 0200 message (1) Ship reports not previously issued since 0600 (2) "Horta" BBBDD FwwMM cbWVH CNRRS (3) Ob. from Icelandic stations when received too late for inclusion in 1900 message
In cases of breakdown or other delay in commencing transmission on 4100 metres, should transmission not have commenced at the expiration of 10 minutes after the scheduled time, the message will be sent on 1400 metres, 10 min. after the routine time)	0600	0100	S.	"	
		2300	S.	"	
		0100	U.W.	"	
		0100	U.A.T.	"	
		—	O.	"	
	0800	0700	S.	"	
		0700	U.W.	"	
		0700	U.A.T.	"	
		—	O.	"	
	1400	1300	S.	N.I.C.	
		0700	U.W.	"	
		0700	U.A.T.	"	
		—	O.	"	
		1300	S.	"	
		1300	U.W.	"	
		1300	U.A.T.	"	
		—	O.	"	
	1900	1800	S.	"	
		1800	U.W.	"	
		1800	U.A.T.	"	
		1800	O.	"	
	1940	1800	O.	N.I.C. ships	
			S.	N.I.C.	
			S.	"	

NOTES: (1) In U.A.T. reports YY is the day of the month and GG the hour of the day G.M.T.

(2) In Ship's reports, Illl is the longitude in degrees and tenths; also in the code for present weather ww, 03— fine or fair with exceptional visibility, and 13— cloudy or overcast, with exceptional visibility.

(3) For stations 91-96 inclusive the unit of pressure is the mm., and of temperature the degree C.

(4) Reports from stations 91-96 inclusive are usually distributed among those from British stations.

(5) Stations regularly included are printed in capital letters in the list below. If a regular station should be missing on any occasion a neighbouring station is inserted if available.

(6) Nephoscope ob. (group C₁ddVV) of medium or high cloud do not always refer to the station to which the cloud group is assigned in the synoptic message, but may have been made at a neighbouring station not included in the message if no nephoscope ob. are available from the synoptic station itself. Nephoscope ob. are usually not given for more than six or eight stations, which are normally sufficient to give a representation of upper cloud motion over the British Isles.

(7) Reports received too late for inclusion in the 0800 and 1400 messages are added to the 0835 and 1435 Aviation Synoptic Reports (q.v.)

REAT BRITAIN—contd.

(8) At British stations, for reports at the standard hours (0100, 0700, 1300, 1800 G.M.T.) the code letter for past weather W always refers to the preceding period of five, six or seven hours since the last standard hour. For reports at other hours W refers to the period since the preceding report or the preceding standard hour, whichever is shorter. In the case of past weather referred to in the specification of the present weather code ww, the period is the hour preceding the time of ob.

(9) When reports from Icelandic stations are received too late for inclusion in the synoptic message containing British ob. made at the same hour, they are added to later routine messages.

(10) The heights for U.W. are given in feet.

(11) Navigation warnings of a specially urgent nature are transmitted when necessary at the end of the 0600, 0800, 1400, 1900 and 1940 synoptic messages above.

STATIONS:

1 LERWICK (C)	31 Birr Castle (L)	54 ROSS-ON-WYE (L)	72 PLYMOUTH (C)
2 STORNOWAY (C)	33 HOLYHEAD (C)	56 Larkhill (L)	73 Portland (C)
3 WICK (C)	34 Liverpool (C)	57 Andover (L)	74 CALSHOT (C)
4 Castlebay (C)	35 Shotwick (L)	58 Farnborough (L)	75 Beachy Head (C)
5 Nairn (L)	36 Manchester (L)	60 Kew (L)	76 Dungeness (C)
6 ABERDEEN (C)	38 Spurn Head (C)	61 CROYDON (L)	77 GUERNSEY (C)
7 Leuchars (L)	41 Birmingham (L)	62 Biggin Hill (L)	78 JERSEY (C)
8 MALIN HEAD (C)	42 Castle Bromwich (L)	63 Clacton (C)	81 St. Catherine's Pt. (C)
9 RENFREW (L)	43 Nottingham (L)	64 Shoeburyness (C)	91 Thorshavn (Denmark)
1 INCHKEITH (C)	44 CRANWELL (L)	65 Grain (C)	92 Seydisfjord (Iceland)
2 Eskdalemuir (L)	45 YARMOUTH (C)	66 Lympe (L)	93 Akureyri (Iceland)
3 TYNEMOUTH (C)	50 VALENCIA (C)	67 Deal (C)	94 Isafjord (Iceland)
4 BLACKSOD POINT (C)	51 ROCHE'S POINT (C)	68 North Foreland (C)	95 Reykjavik (Iceland)
5 DONAGHADEE (C)	52 PEMBROKE (C)	70 SCILLY (C)	96 Vestmanna (Iceland)
6 Flamborough (C)	53 Leafield (L)	71 Falmouth (Pendennis) (C)	"Horta" (name in full)

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Air Ministry (London), GPA, 1680 c.w.	0336*	0300	S.	N.I.C.	AVIATION SYNOPTIC. (1) "Météor" [0300] (61, 62, 66) xInIn(Vs) wwVhL NDDEFW (where x is a check figure, being the units digit in the sum of the figures wwVhL) (2) "CND" (ob. at Croydon five minutes before time of transmission of message) wwVhL (1) "Météor" [0400] (61 and 66) InIn(Vs) BBBDD FwwTT cbWVh ALaNh CaddF ₁ S (62) xInIn(Vs) wwVhL NDDEFW CaddF ₁ S (2) Same form as Part (2) of 0336 message Same form as 0336 message
* These messages are discontinued during the winter months, and are not usually issued on Sundays	0436*	0400	S.	"	(1) "Météor" [0400] (61 and 66) InIn(Vs) BBBDD FwwTT cbWVh ALaNh CaddF ₁ S (62, 75) xInIn(Vs) wwVhL NDDEFW CaddF ₁ S (2) Same form as Part (2) of 0336 message Same form as 0336 message
	0536*	0500	S.	"	(1) "Météor" [0700] (61, 66) InIn(Vs) BBBDD FwwTT cbWVh ALaNh CaddF ₁ S (62, 75) xInIn(Vs) wwVhL NDDEFW CaddF ₁ S (2) "Pilot" (61 or 66) InIn 49GG h ₁ ddvv h ₁ ddvv, etc. (where GG=G.M.T. of pilot balloon ascent) (3) Same form as Part (2) of 0336 message
	0636*	0600	S.	"	(1) "Météor" [0800] same form as Part I of 0336 message (2) "Forecast" Forecast for S.E. England for period of daylight following time of issue (3) Same form as Part (2) of 0336 message (4) Reports received too late for inclusion in the British and Icelandic Report (q.v.) at 0800 G.M.T.
	0736	0700	S.	"	(1) "Météor" [0900] (61, 62, 66, 75) xInIn(Vs) wwVhL NDDEFW (76) InIn(Vs) (2) "Pilot" same form as Part (2) of 0736 message—only included if no pilot balloon ascent was available for the 0736 message and one has become available since (3) Same form as Part (2) of 0336 message
			U.W.	"	
			S.	"	
	0836	0800	S.	"	
			F.	Forecast	
			S.	N.I.C.	
			S.	"	
	0936	0900	S.	N.I.C.	
			U.W.	"	
			S.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) GREAT BRITAIN—contd.	(2)	(3)	(4)	(5)	(6)
	1036	1000	S.	"	(1) "Météor" [1000] (61, 62, 66) InIn(Vs) BBBDD FwwTT cbWVH ALaNH CaddF ₁ S
		1000	S.	"	(2) Same form as Part (2) of 0336 message
		1000	S.	"	(3) (50, 72, 74) InIn BBBDD FwwTT cbWVH ALaNH
	1136	1100	S.	"	(1) "Météor" [1100] (61, 62, 66, 75) xInIn(Vs) wwVhL NDDFW
			U.W.	"	(2) "Pilot" same form as Part (2) of 0736 message
			F.	Forecast Code	(3) "Forecast" same form as Part (2) of 0836 message
			S.	N.I.C.	(4) Same form as Part (2) of 0336 message
	1236	1200	S.	"	(1) "Météor" [1200] (61, 62, 66) xInIn(Vs) wwVhL NDDFW
			S.	"	(76) InIn(Vs)
	1336	1300	S.	"	(2) Same form as Part (2) of 0336 message
			U.W.	"	Same form as 0736 message
	1436	1400	S.	N.I.C.	"Météor" [1400] (1) Same form as Part (1) of 0836 message
			F.	Forecast Code	(2) "Forecast" same form as Part (2) of 0836 message
			S.	N.I.C.	(3) Same form as Part (2) of 0336 message
			S.	"	(4) Reports received too late for inclusion in British and Icelandic Report at 1400 (q.v.)
	1536	1500	S.	"	Same form as 1236 message
	1636	1600	S.	"	(1) "Météor" [1600]. Same form as Part (1) of 1036 message
			S.	"	(2) Same form as Part (2) of 1036 message
					NOTES: (1) The figures in square brackets indicating the time of ob. vary according to the message
					(2) Ob. from the Azores are added to the first route report sent out after the reception of the ob. in London. (They are only included in these messages when received after the transmission of the 0850 International Collective Message)
				N.I.C.	Code: BBBDD Fwwmm cbWVH CNRRS (pressure in mb. and minimum temp. in degrees F)
					Stations: Horta and Ponta Delgada (P.D.) Ob. from Madeira at 0700 G.M.T. are added to the 1136 message or to a later one, according to time of receipt of data in London
				N.I.C. (mod.)	Code: BBDDF WTTK'R (Where W=present weather in O.I.C. pressure is given in mb. and temp. in degrees F. Station: Funchal)

(3) Reports from ships at sea are added to the next hourly route report issued after they are received. Code as in Ships Code, General Synoptic issue.

(4) The word "botley" when it occurs in a message is followed by a statement in p.i. of the conditions on the North Downs (Botley Hill), as viewed from Biggin Hill, when such a statement adds material information to that contained in the rest of the message.

(5) When bad weather conditions prevail on the normal air routes between Croydon and the Channel, report from certain stations on an alternative route (Isle of Grain, N. Foreland and Deal) are included in Part (1) of the hourly messages in the form: xInInVs wwVhL

(6) When a report from Beachy Head is received too late to be included in the corresponding hourly route message, it is included in the next hourly route message issued, the time of ob. (G.M.T.) being added in a four-figure group GGgg (hours and min.) after the index numbers, thus: xInInVs GGgg wwVhL NDDFW CaddF₁S

STATIONS:

61 Croydon (L)
62 Biggin Hill (L)
65 Isle of Grain (C)

66 Lympne (L)
67 Deal (C)
68 North Foreland (C)

75 Beachy Head (C)
76 Dungeness (C)
50 Valencia (C)

72 Plymouth (C)
74 Calshot (C)

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) IRELAND —contd. Air Ministry (London), GFA, 4100 C.W.	(2) 1950	(3) 1800	(4) F.	(5) Forecast Code	(6) “Group 999” Forecast for England and Southern Scotland in special code
Valencia, GCK, 600 sp.	0915	0700	F.	p.l.	WESTERN SEABOARD REPORTS (SYNOPTIC) FOR MARINERS. (1) “Western” <i>en clair</i> statement of the general meteorological situation and forecast for 24 hours for the Western Seaboard of the British Isles (2) (Stations in the order given in the list) BBDFV _s BBDFV _s BBDFV _s BBDFV _s BBDFV _s K'K'K'K'K' As for 0915 message above NOTES: (1) The last group of figures in (2) gives bar. tendency (K') for the stations in their order (2) Missing ob. are replaced by a hyphen, (3) D is wind direction on scale 0-8, 0=calm 2=E, 8=N., etc. Other symbols in N.I.C. Stations (taken in order in messages) Stornoway, Blacksod Point, Holyhead, Scilly Dungeness
		0700	S.	N.I.C.	
	2115	1800	F.S.	„	



CHART SHOWING METEOROLOGICAL FORECAST AREAS, DISTRICTS AND OBSERVATION STATIONS.

(Adapted from Chart in Admiralty Notice to Mariners, 8th December, 1923.)

STATIONS:

- | | | | | |
|-------------|--------------|------------|-------------|-------------|
| 0 Wick | 2 Malin Head | 4 Holyhead | 6 Guernsey | 8 Yarmouth |
| 1 Stornoway | 3 Valencia | 5 Scilly | 7 Dungeness | 9 Tynemouth |

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) GREAT BRITAIN—<i>contd.</i>	(2)	(3)	(4)	(5)	(6)
Malin Head, GMH, 600 sp. . .	0900 2100	0700 1800	F.S. F.S.	" "	Same form as 0915 and 2115 messages respectively from Valencia GCK above
Air Ministry (London), GFA, 4100 c.w.	0900	0700	G.	p.l.	SHIPPING REPORTS. (1) "Weather Shipping" "Inference General summary of weather conditions over North-west Europe and adjacent seas
		0700	S. F.	N.I.C. p.l.	(2) "Station Reports" InK'wwvs BBDE (3) Forecast of wind and visibility for 12 hours following time of ob. for Western Area (See map for area)
			F. F. F.	" " "	(4) Ditto for Southern area (5) Ditto for Eastern area (6) "Outlook." General statement as to expectation of weather after the period of forecasts (when it can be made)
	2000	1800	G.S.F.	A	As for 0900 message

NOTES: (1) During the time of S.O.S. look-out from 0915 to 0918 and from 2015 to 2018, there will be a pause in the transmission of these messages.

(2) The boundaries of the areas are defined by thick black lines and the coast line. These areas are subdivided into districts, named after islands, rivers or banks within them, so that they may be readily memorised. The boundaries of the districts are shown by dotted lines, and should only be taken as an approximate indication of the extent. These districts are for the purpose of giving information of different weather within an area, without unduly lengthening the wording of the message (See map page 731.)

(3) The name of the area, and, when subdivision is necessary, that of the district, will precede each forecast.

(1) Niton (I. of W.) GNI	(2) request	(3)	(4)	(5)	(6)
Land's End GLD	"				Storm warnings <i>en clair</i> are preceded by International Safety Signal and repeated at short intervals ten times on full power
Fishguard GRL	"				These stations transmit weather reports <i>on demand</i> at the following charges:—
Seaforth (Liverpool) .. GLV	"				(a) Where the information is supplied at the station itself, a charge of 5s. will be made for each message.
Port Patrick GPK	"				(b) Where the information is not available at the station, but has to be obtained specially from some other source (e.g., the Meteorological Office, London), the charge for each message will be 7s. 6d., which amount includes cost of inland transmission.
Wick GKR	"		W.	p.l.	
Cullercoats (Newcastle) GCC	"		S.	p.l.	
Grimsby GKZ	"				
North Foreland GNF	"				
Valencia GCK	"				
Malin Head GMH	"				
all 600 sp.					

NOTE: A gale warning is issued when the strength of the wind is expected to reach or exceed 40 miles per hour (Force 8 on Beaufort Scale). The warnings are sent by the Meteorological Office, Air Ministry, to those stations which lie within about 150 miles of the area threatened.

WARNINGS OF SQUALLS OR THUNDERSTORMS.

Warnings of Squalls or Thunderstorms which are reported from stations lying on or near aerial routes are broadcasted from the Meteorological Office, Air Ministry, on a wavelength of 1400 metres.

Devizes GKU, 2100 c.w. . .	"	—	S.	p.l.	This station transmits weather reports <i>on demand</i> (as above)
	(See notes)	0100	O.	N.I.C. (ships)	Reports sent to the Meteorological Office, Air Ministry, from ships at sea
		0700	O.	"	NOTE: Ships transmit their reports as soon after the ob. hours as possible
		1300	O.	"	
		1800	O.	"	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
GREECE					
Athens, SXG, 3,600 sp. ..	0705	0600	S.	N.I.C.	"Meteor Athènes 1" (or only) BBBDD FwwTT cbWVH ALANh RRmmr
	1035	0600	S.	O.I.C. mod.	"Meteor Athènes 2" InIn BBDD FwTT 8bbR NOTES: (1) R has same meaning as in N.I.C., the period being only the preceding 12 hours in the case of stations marked thus* Stations: 01 Athens* 09 Canea* 17 Sulina* 02 Corfu* 10 Candia* 18 Constantza* 03 Zante* 11 Sollum 19 Craiova* 04 Salonika* 12 Alexandria 20 Crikvenica 05 Volos* 13 Suez 21 Sarajevo 06 Mitilini* 14 Limassol 22 Belgrade 07 Andros* 15 Jassy* 23 Sofia 08 Santorim* 16 Bucharest* 24 Constan- tinople
Athens, SXA, 600 sp. ..	1045	0600	S.	p.l.	Meteorological report of the Athens Observa- tory for ships, containing:— (1) State of the sea and sky for the Ægean and Ionian seas. (2) Direction and force of the wind at Crete, Cyprus, Alexandria and Malta. General information regarding gales.
Saloniki, SXC, 7,000 c.w. ..	0330 0730	—	W.	p.l.	
HAITI REPUBLIC					
Port au Prince, NSC, 2,255..	—	—	W.	p.l.	Hurricane warnings are transmitted when issued by the Washington Weather Bureau and repeated every 4 hours.
HAWAIIAN ISLANDS					
Pearl Harbour, NPM, 2,255 sp.	0630 1830 2230	—	S F. F.S.	U.S.A. (special) p.l. p.l. U.S.A. (special)	InInIn BBBDF W'bwAC Forecast, <i>en clair</i> for Hawaiian Is., and neighbouring ocean areas. Forecast as for 1830 message. InInIn BBBDF W'bwAC NOTES: (1) These reports also issued on request. (2) Reports issued by Honolulu Weather Bureau.
HOLLAND					
Soesterberg, STB, 1,900 c.w.	0730	0700	S.	N.I.C.	SYNOPTIC REPORTS. "Météo Holland" (1) (03 only) InIn BBBDD FwwTT cbWVH ALANh RRmmr C ₁ ddVV (or and 02) InIn BBBDD FwwTT cbWVH ALANh RRSVsr C ₁ ddW (2) "Pilot" (or and 03) InIn h ₁ ddvv h ₁ ddvv, etc. (3) "Temp" (or and 03) InIn ddt BBTH BBTH, etc. (1) InIn BBBDD FwwTT cbWVH ALANh C ₁ DDVV (2) Same form as 0730 (2) message above (3) Same form as 0730 (3) message above Same form as 0730 message above. NOTES: (1) In part (3) of above messages, dd = day of month and tt = hour of day (G.M.T.) of ob. Stations: 01 Helder (C), 02 Flushing (C), 03 De Bilt (L)
	1330	1300	S.	N.I.C.	
	1830	1800	U.W. U.A.T. S.U.W. U.A.T.	" " N.I.C. "	
Soesterberg, STB, 1,680 c.w. (1900 c.w. for 0855 and 1505 messages only)	0745 1045 1345	0700 1000 1300	S.	N.I.C.	AVIATION SYNOPTIC REPORTS. (1) "Météo Holland" (1-3) (0700) In (Vs) BBBDD FwwTT cbWVH ALANh CaddF ₁ S (5-6) (0700) In (Vs) wwVhL NDDFWs (2) "Pilot" In h ₁ ddvv h ₁ ddvv, etc. (3) "Temp" In ddt BBTH BBTH (1) (5-6) (0620) In(Vs) wwVhL NDDFWs
	0645 0845	0620 0820	U.W. U.A.T. S.	" " "	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
HOLLAND -- <i>contd.</i>					
	1145 1245 1445	1120 1220 1420	F.	p.l.	(2) Forecast for London-Amsterdam A Route (in English) Forecast for Amsterdam-Paris Air Ro (in French).
	0945 0905 1505	0920 —	S. F. U.W. U.A.T. U.A.T.	N.I.C. p.l. N.I.C. N.I.C.	(1) (2, 5, 6) (0920) In(Vs) wwVhL NDDFY (2) Revised forecast as for 0645 (2) messag "Pilot" In ddt h,ddvv h,ddvv, etc. "Temp" In ddt BBTTH BBTTH NOTES: (1) UW are from the result of pilot balloon ascent at De Bilt and Held (velocity given in km/hr.), and U.A.T. c are from results of an aeroplane ob. at Soesto berg and Helder. (2) dd = day of month; tt = hour day (G.M.T.) Stations: 1 Helder, 2 Flushing, 3 De B 5 Schiphol, 6 Rotterdam (Waalhaven Aer drome).
Scheveningen, PCH, 1,800 sp.	1115 2315 request	0700 1800 —	S. W.	O.I.C. p.l.	SPECIAL REPORTS FOR MARINERS. "K.N.M.I." (1-4) BBBDD FWT (5-8) BBBDD FWTT Followed by storm signal (when necessar and notices to mariners (in Dutch and Englis see Hydrographic Section. NOTES: (1) x denotes missing ob. (2) No index numbers are transmitted, t fixed order of stations as given below bei adhered to. (3) The storm signal gives notice of shift of centre of storm. (4) Messages are sent three times in se cession. Stations: Helder, Flushing, Griz Noz, T Hague, Yarmouth, Tynemouth, Skudesna Keitum.
HONDURAS					
Swan Is., US, 2,240 sp.	0445	0100	F.	p.l.	Message <i>en clair</i> containing wind and weath forecasts for the western part of the Gulf Mexico (west of longitude 90°), eastern p of the Gulf of Mexico (east of longitude 90 the Caribbean Sea (west of longitude 73°) a for the Windward Passage. Whenever the co ditions warrant, the forecasts will be preced by storm or hurricane warnings, and warni regarding "northers" during the win months. NOTE: When a hurricane is in progr the Weather Bureau will issue reports rega ing its location, direction, progress and intens at frequent intervals.
	1730	1300	S. F.	American p.l.	In (or InIn or InInIn) BBBDF As for 0445 message above. NOTES: (1) x = missing ob. Stations: SI Swan Is., BZ Belize (Hondur BFD Bluefields (Nicaragua), W Willemst (Curaçao), SJ San Juan (Puerto Rico), Port au Prince (Haiti), CFG Cieufuegos (Cul LFE La Fé (Cuba), KN Kingston (Jamaic TI Turks Is. (Bahamas).
HONG KONG.					
Cape d'Aguilar, VPS, 600 sp.	0500 0900 0400 approx.	— — —	S.F. S.F. W.	p.l. p.l.	<i>En clair</i> summary of weather conditi and forecasts. These warnings are repeated every 2 ho until 1600

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
HUNGARY.					
Opel (Near Budapest), HB, 400 c.w.	0910	0600	S	O.I.C.	<p>SYNOPTIC REPORTS.</p> <p>"Météo Hongrois"</p> <p>In In BBBDD FWTTT βbbRR MMmm</p> <p>NOTE.—This report is issued by the Institute of Meteorology and Magnetism, Budapest. Stations: 01 Budapest, 02 Szombathely, 03 Kaposvar, 04 Szeged, 05 Debreczen.</p>
ICELAND.					
Reykjavik, TFA, 1,800 sp. . .	1100 (see note)	0900 0700	S S	N.I.C. mod.	<p>SYNOPTIC REPORTS.</p> <p>(1) (Ob. at 0900 at Reykjavik, Vestmannaeyjar, Isafjörður, Akreyri, Seyðisfjörður and Thorshavn). TTDFw BBbw</p> <p>(2) (Ob. at 0700 at Grindavík, Stykkishólmur, Grimstadir, Raufarhöfn, Hóla, Copenhagen, Bergen, Tynemouth, Lerwick and Jan Mayen.) TTDFw</p> <p>(3) Résumé of meteorological situation and forecasts for Iceland North-east (valid for 24 hours) and Iceland South-west (valid for 12 hours)</p> <p>Similar to 1110 (1) and (2) message above, except that stations at Grimstadir, Copenhagen, Bergen, Tynemouth, Lerwick and Jan Mayen are omitted.</p> <p>NOTES: (1) Reports broadcast <i>daily</i>, except that on Sundays and holidays transmission is at 1230 instead of 1100</p> <p>(2) D = Direction of wind (scale 0-S; 9 = no ob.)</p> <p>(3) F = Beaufort wind scale. When the wind exceeds 9 on this scale, it is signalled by 9 followed by the words "ROK" (whole gale) "Ofsædur" (storm) or "Farvidri" (hurricane)</p> <p>(4) Wand w = past and present weather respectively as follows:—</p>
	1900	1800	S	N.I.C. mod.	<p>Code.</p> <p>0 = Clear sky. 1 = Cloudy. 2 = Fog, mist. 3 = Light rain. 4 = Moderate rain.</p> <p>Code.</p> <p>5 = Heavy rain. 6 = Light snowfall. 7 = Moderate snowfall. 8 = Heavy snowfall. 9 = Hail.</p> <p>(5) Missing observations are replaced by a hyphen and stations that are omitted by the word "Vantar" (missing)</p>
ITALY					
Rome (S. Paolo), IDO, 11,000 c.w.	0930	0700	S	O.I.C. mod.	<p>SYNOPTIC REPORTS.</p> <p>InIn BBBDD F₁WTTW' βbbRR MMmmu</p>
			U.W.	special	V ₁ D ₁ V ₂ D ₂ V ₃ D ₃ V ₄ D ₄ V ₅ D ₅ V ₆ D ₆
	2015	1800	S U.W.	O.I.C. mod. special	<p>In In BBBDD F₁WTTu</p> <p>V₁D₁V₂D₂V₃D₃ V₄D₄V₅D₅V₆D₆</p>

ITALY—contd.

NOTES: (1) "x" is used to denote missing information

(2) F_1 = Force of surface wind

(3) V = Speed of upper wind

Code No.	Beaufort Code No. (F ₁)	Speed in metres (V) per sec.
0	= 0 or 1	= 0 to 1
1	= 2	= 1 " 3
2	= 3	= 3 " 5
3	= 4	= 5 " 7
4	= 5	= 7 " 9
5	= 6	= 9 " 11
6	= 7	= 11 " 13
7	= 8	= 13 " 15
8	= 9	= 15 " 17
9	= 10, 11, or 12	= above 17

(4) D = direction of U.W. (where 1 = N, 2 = N.E. 8 = N.W., etc.)

(5) U.W. are reported at the six heights 500m, 1,000m, 1,500m, 2,000m, 3,000m, 4,000m, above mean sea level

Stations:	01 Turin	12 Maddalena
	02 Milan	13 Naples
	04 Padua	14 Brindisi
	05 Trieste	15 Cagliari
	06 Genoa	16 Messina
	07 Florence	17 Palermo
	08 Leghorn	18 Vittoria
	09 Ancona	19 Taranto
	10 Chieti	20 Venice
	11 Rome	21 Vigna di Valle

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Rome (Centrocelle), ICD, 2,250 sp.	0930	0700	S	—	Times and codes as for Rome (S. Pao above)
Naples, ICN, 3,800 c.w.	2045	1800	"	—	These reports contain ob. at Naples, Maddalena, Brindisi, Messina and Vittoria
	0800	—	"	—	These reports contain ob. at Florence
Florence, GIF, 900	1930	—	"	—	Turin and Padua
	0810	—	"	—	Forecast <i>en clair</i> for the Lower Adriatic and Ionian Sea.
	1940	—	"	—	
Taranto, ICT, 5,000 c.w.	1930	—	F	p.l.	

JAMAICA.

Kingston, VQI, 600 sp.	0100	—	—	—
	1300	—	—	—

JAPAN.

Choshi, JCS	0300	—	S.	special	All these stations transmit weather reports in the Japanese Code
Otschishi, JOC	0900	—	S.	—	
Funabashi, JJC	2100	—	S.	—	These reports give the following details:
Shiomisaki, JSM	—	—	—	—	(1) Barometric pressure
Shimotsui, JSX	—	—	—	—	(2) Force of wind and state of weather
Tsuno sima, JTS	—	—	—	—	(3) Direction of wind
Ose Saki, JOS	—	—	—	—	(4) Positions of zones of high and low pressure with approximate pressure
Horomushiro, JHJ	—	—	—	—	(5) Direction in which depression is moving and velocity
Dairen wan (Kwang Tung), JDA, Keelung	0400	—	—	—	(6) Details of depression
	1000	—	—	—	
	2200	—	—	—	
Formosa (Keelung)	1230 request	—	W.	Code A	"QST QST QST" followed by message which is sent three times

Storm signals are also broadcast immediately upon receipt, and at the commencement of each succeeding hour. These messages are sent in Code A (Japanese Storm and Typhoon Warnings)

They are also transmitted on request. Foreign ships are charged for these special messages.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
JAPAN—contd.					
Tienwan (Kwang-Tung), DA	1300 request	—	W.	Code A	As for 1230 message from Formosa (above)
Osaka, JCS, 600 sp.	1205	—	W.	Code A	As for 1230 message from Formosa (above)
Yokohama, JOC Yokohama, JSM Yokohama, JSX Yokohama, JTS	—	—	W.	Code A	Warnings are broadcasted immediately upon receipt, and at the commencement of each succeeding hour. The messages are sent in Code A
Yokohama, JOS All above 600 sp.)	.. ..	.. ..	.. ..	.. ..	They are also transmitted on request. Foreign ships are charged for these special messages
Kobe Met. Ob. (Kobe), JTJ, 600 sp. (day), 750 sp. (night)	0030 0630 1230	—	W.	p.l.	The storm warnings are broadcasted <i>en clair</i> in English. The message is as follows :— QST QST —•••— JTJ This is followed by the text of the message which is transmitted twice, in accordance with Code B.

JAPANESE WEATHER BULLETINS.

A synoptic report of actual meteorological conditions is transmitted daily by Japanese W/T stations (including those in Formosa and Kwang-Tung), in accordance with the scheduled information, using the code given below.

These reports are transmitted from the Central Meteorological Observatory, Tokyo, to the W/T stations at 00, 0900 and 2100 G.M.T., and are immediately broadcasted by the stations on receipt.

CODE : EXPLANATORY NOTES.

Tables I, II and III, contain the signals for reporting atmospheric pressure, force of the wind and state of the weather, and the direction of the wind, respectively.

Zones of high pressure and depressions are reported by means of the following code :—

High pressure area or depression.

High pressure area or depression.

High pressure area	{ position barometer remarks	Code. Table IV " V " VI	Secondary depression	{ position barometer direction velocity remarks (1) " (2)	Code. Tables IV and VII Table VIII " IX " X " XI " XII
Primary depression	{ position barometer direction velocity remarks (1) " (2)	Tables IV and VII Table VIII " IX " X " XI " XII			

The position of the high pressure area is indicated by means of the signals in Table IV. The first letter indicates the latitude and the second the longitude.

Atmospheric pressure is indicated as in Table V ; and " Remarks " as in Table VI.

The first two letters denoting the position of the depression give the Lat. and Long. in degrees according to Table IV. The third letter gives the position within the two-degree square (Table VII).

Barometric pressure at the centre of the depression is given according to Table VIII, and the direction of movement from Table IX. Velocity is given according to Table X ; first remarks according to Table XI ; and second remarks according to Table XII.

With the exception of Tables I, IV and VII, one symbol is given for each Table forming the code ; Tables I and IV are represented by two symbols, except when the last-named is used in conjunction with Table VII, then three symbols are sent representing Tables IV and VII as already explained above.

JAPAN—contd.

JAPANESE METEOROLOGICAL CODE.

Table I—Barometric pressure.

Millimetres.		Tenths.									
		0	1	2	3	4	5	6	7	8	9
710 and under	..	AA									
711	..	AB		AC		AD		AE		AF	
2	..	AG		AH		AI		AJ		AK	
3	..	AL		AM		AN		AO		AP	
4	..	AQ		AR		AS		AT		AU	
5	..	AV		AW		AX		AY		AZ	
6	..	BA		BB		BC		BD		BE	
7	..	BF		BG		BH		BI		BJ	
8	..	BK		BL		BM		BN		BO	
9	..	BP		BQ		BR		BS		BT	
720	..	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD
1	..	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN
2	..	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX
3	..	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DX
4	..	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR
725	..	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB
6	..	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL
7	..	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV
8	..	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF
9	..	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP
730	..	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ
1	..	GA	GB	GC	GD	GE	GF	GG	GH	GI	GO
2	..	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GH
3	..	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD
4	..	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN
5	..	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HO
6	..	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH
7	..	II	IJ	IK	IL	IM	IN	IO	IP	IQ	II
8	..	IS	IT	IU	IV	IW	IX	IY	IZ	JA	IJ
9	..	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JK
740	..	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JL
1	..	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KK
2	..	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KL
3	..	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KM
4	..	LA	LB	LC	LD	LE	LF	LG	LH	LI	LN
5	..	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LM
6	..	LU	LV	LW	LX	LY	LZ	MA	MB	MC	LM
7	..	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MM
8	..	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MM
9	..	MY	MZ	OA	OB	OC	OD	OE	OF	OG	MO
750	..	OI	OJ	OK	OL	OM	ON	OP	OQ	OR	OP
1	..	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PP
2	..	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PP
3	..	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PP
4	..	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QQ
5	..	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ
6	..	QR	QS	QT	QU	QV	QW	QX	QY	QZ	QR
7	..	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RR
8	..	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RR
9	..	RV	RW	RX	RY	RZ	SA	SB	SC	SD	RS
760	..	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SS
1	..	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SS
2	..	SZ	TA	TB	TC	TD	TE	TF	TG	TH	SS
3	..	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TT
4	..	TT	TU	TV	TW	TX	TY	TZ	UA	UB	TT
5	..	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UU
6	..	UN	UO	UP	UQ	UR	US	UT	UU	UV	UU
7	..	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VV
8	..	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VV
9	..	VR	VS	VT	VU	VV	VW	VX	VY	VZ	VV
770	..	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WW
1	..	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WW
2	..	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XX
3	..	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XX
4	..	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XX
5	..	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YY
6	..	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YY
7	..	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZZ
8	..	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZZ
9	..	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZZ
780	..	ZX	ZY								
781 and over	..	ZZ									

PAN—contd.

Table II.—Force of the Wind and State of the Weather.

Weather.	Wind Force.					
	0 — 1 (Calm).	2 — 3 (Light winds).	4 — 5 (Fresh winds).	6 — 7 (Strong winds).	8 — 9 (Hurricane).	10 (Typhoon).
Clear	A	A	B	C	D	E
Cloud	F	F	G	H	I	J
in	K	K	L	M	N	P
ow	Q	Q	R	S	T	U
g	V	V	W	X	Y	Z

The Beaufort Scale should be consulted for the correct terms to be applied to the wind forces quoted above.

NOTE: Although the same signals are given for "Calms" and "Light Winds," the former is always meant when the direction of the wind is omitted.

Table III.—Direction of the Wind.

Code	Code	Code	Code
3 S.E.	5 S.W.	7 N.W.	0 Calm
4 S.	6 W.	8 N.	

Table IV.—Positions of Zones of High and Low Pressure.

Latitude N.	Latitude N.	Longitude E.	Longitude E.
Code.	Code.	Code.	Code.
A 4° — 6°	N 30° — 32°	A 104° — 106°	N 130° — 132°
B 6 — 8	P 32 — 34	B 106 — 108	P 132 — 134
C 8 — 10	Q 34 — 36	C 108 — 110	Q 134 — 136
D 10 — 12	R 36 — 38	D 110 — 112	R 136 — 138
E 12 — 14	S 38 — 40	E 112 — 114	S 138 — 140
F 14 — 16	T 40 — 42	F 114 — 116	T 140 — 142
G 16 — 18	U 42 — 44	G 116 — 118	U 142 — 144
H 18 — 20	V 44 — 46	H 118 — 120	V 144 — 146
I 20 — 22	W 46 — 48	I 120 — 122	W 146 — 148
J 22 — 24	X 48 — 50	J 122 — 124	X 148 — 150
K 24 — 26	Y 50 — 52	K 124 — 126	Y 150 — 152
L 26 — 28	Z 52 — 54	L 126 — 128	Z 152 — 154
M 28 — 30		M 128 — 130	

Table V.—Approximate Barometric Pressure in High Pressure Zone.

Millimetres.	Units.									
	0	1	2	3	4	5	6	7	8	9
750								Z	Y	X
760	W	V	U	T	S	R	Q	P	O	N
770	M	L	K	J	I	H	G	F	E	D
780	C	B	A							

Table VI.—Remarks on High Pressure Zone.

Code.	Meaning.
A	Barometric pressure within the zone will probably rise gradually.
B	Barometric pressure within the zone will probably fall gradually.
C	High pressure zone will probably move East.
D	High pressure zone will probably move North.
E	High pressure zone will probably move N.E.
F	High pressure zone will probably move S.E.
G	High pressure zone will probably move South.
H	High pressure zone appears to be stationary.
I	High pressure zone appears to be moving.
J	High pressure zone is the eastern part of high pressure system over Siberia.
K	High pressure zone is the western part of a high pressure zone over the North Pacific.
L	Independent high pressure zone of large extent.
M	Independent high pressure zone of small extent.
N	High pressure zone disposed to move and will gradually develop.
O	No remarks.
P	High pressure zone disposed to move and will gradually disperse.
Q	High pressure zone is eastern part of high pressure system over Siberia and will gradually develop.
R	High pressure zone is eastern part of high pressure system over Siberia and will gradually disperse.
S	High pressure zone is the western part of high pressure system over the North Pacific and will gradually develop.

JAPAN—*contd.*

- T High pressure zone is the western part of high pressure system over the North Pacific and will gradually disperse.
- U There are other high pressure zones over the Pacific area.
- V There are other high pressure zones over the Continent.
- W There are other high pressure zones.
- X Barometric pressure rising within the high pressure zone; monsoon strengthening.
- Y Barometric pressure stationary within the high pressure zone; monsoon will continue.
- Z Barometric pressure falling within the high pressure zone; monsoon will disperse.

Table VII—Position within 2-degree Square of Lat. and Long. as given in Table IV.

Quarter					Sub-division.				
					1	2	3	4	
1	A	E	F	G	H				
2	B	I	J	K	L				
3	C	M	N	P	Q				
4	D	R	S	T	U				

2-degree square :

j	i	f	e
k	B	A	h
n	m	s	r
C	D	t	u

Table VIII—Low Barometric Pressure.

	Millimetres.	Units.				
		0	2	4	6	8
710			Z	Y	X
720	W	V	U	T	S
730	R	Q	P	N	M
740	L	K	J	I	H
750	G	F	E	D	C
760	B	A			
Unknown	O				

Table IX—Direction in which Depression is Moving.

Code.	Meaning.	Code.	Meaning.	Code.	Meaning.	Code.	Meaning.
A	N.N.E.	H	W.S.W.	N	N.E., but re-curving.	V	N., curving N.E.
B	N.E.	I	W.	P	N.E., curving N.	W	N. do. N.W.
C	E.N.E.	J	W.N.W.	Q	E. do. S.E.	X	Stationary.
D	E.	K	N.W.	R	E. do. N.E.	Y	Moving steadily; depression increasing.
E	E.S.E.	L	N.N.W.	S	W. do. N.	Z	Moving steadily; depression dispersing.
F	S.E.	M	N.	T	N.W. do. N.E.	O	Unknown.
G	S.W.			U	N.W. do. W.		

Table X—Velocity in Kilometres per hour at which Depression is Moving.

[illegible]

JAPAN—contd.

Table XI—Description of Depression.

Code.	Meaning.	Code.	Meaning.
A	Typhoon.	E	Violent cyclone.
B	Depression developing; may become a typhoon.	F	Almost a cyclone.
C	Violent typhoon.	G	Depression developing into almost a cyclone.
D	Cyclone.	H	Depression developing; may become a cyclone.

Table XII—Supplementary Remarks on Depressions.

Code.	Meaning.	Code.	Meaning.
A	Force weak; gradually developing.	R	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido.
B	Force strong; gradually subsiding.	S	Following the cyclone heavy snowstorms from the N.W. will set in over the Japan Sea and the vicinity of Hokkaido.
C	Developing gradually.	T	Following the cyclone a strong N. monsoon will set in over the Eastern China Sea.
D	Subsiding gradually.	U	Following the cyclone a strong N.W. monsoon will set in over the Japan Sea and the vicinity of Hokkaido; and a strong N. monsoon over the Eastern China Sea.
E	Developing rapidly.	V	Cyclone will develop rapidly, accompanied by snowstorms, over the Japan Sea.
F	Subsiding rapidly.	W	Cyclone will develop rapidly, accompanied by snowstorms, over the Yellow Sea.
G	Heavy squalls in vicinity of centre.	X	Cyclone will develop rapidly, accompanied by snowstorms, over the East Sea (To Kai).
H	Snowstorms in vicinity of centre.		
I	Conditions at centre uncertain.		
J	Force weak.		
K	Storm area large.		
L	Snowstorm area large.		
M			
N			
O			
P			
Q			

JAPANESE STORM AND TYPHOON WARNINGS.

Storm and typhoon warnings are broadcasted by the Japanese W/T stations enumerated in the undermentioned schedule. The service includes stations in Kwang-Tung and Formosa (Taiwan). The messages are transmitted either *en clair* or in code. For the latter purpose two separate codes are used, known as "Code A" and "Code B." These are given in detail below.

CODE A.

The message is transmitted in the following form:—

Warning.	Date.	Time.	Position of centre of Depression or Typhoon.	Barometer, at centre.	Direction of movement.
N	DD	TT	Long. Lat.	BBBB	ZZ
WARNING (N):		DATE (DD):	MMM PP	TIME (TT):	
1 = Depression.		01 = 1st day of month.		00 to 23 representing Standard Time in hours.	
2 = Typhoon.		15 = 15th do.			

POSITION (MMM PP):

The position of the centre of the depression or typhoon will be given in degrees of Long. and Lat. Three figures are used for the former, and two for the latter, thus: 135 32 = Long. 135° E. Lat. 32° N.

BAROMETER (BBBB):

The pressure at the centre will be given in inches, indicated by four figures, thus: 2822 = 28.22 inches.

MOVEMENT (ZZ):

This will give the direction in which the centre of the depression or typhoon is moving, according to the undermentioned table:—

Code.	Meaning.	Code.	Meaning.	Code.	Meaning.	Code.	Meaning.
00	Uncertain.	04	E.	08	S.	11	W.S.W.
01	N.N.E.	05	E.S.E.	09	S.S.W.	12	W.
02	N.E.	06	S.E.	10	S.W.	13	W.N.W.
03	E.N.E.	07	S.S.E.			14	N.W.
						15	N.N.W.
						16	N.

CODE B.

The message is transmitted in the following form:

Area threatened.	Storm warning.	Remarks.
------------------	----------------	----------

Code.	A	Code.	C	Code.	E
	Sea Area.—(A)		Warning.—(C)		Remarks.—(E)
1	Yellow Sea (Kokai)	1	Gale from N.E.	0	No remarks.
2	Eastern Sea (To Kai)	2	do. E.	1	Changeable
3	Japan Sea	3	do. S.E.	2	Prospect of wind moderating to-morrow.
4	do. Northern portion	4	do. S.	3	do. continuing unaltered to-morrow.
5	Sea E. of Japan	5	do. S.W.	4	Gale, with prospect of fine weather to follow.
6	Sea S. do.	6	do. W.		
7	Sea S.E. do.	7	do. N.W.		
8	Sea in vicinity of Formosa (Taiwan)	8	do. N.		
9	China Coast,—Northern part	9	Storm probable		
10	do. Southern part	0	Snow storm probable		

Country, Station, Call, Wavelength	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
LATVIA	(1)	(2)	(3)	(4)	(5)
Libau (Liepaja), KCB, 1,200 sp.	0720	0700	S. I.	N.I.C. (mod.)	SYNOPTIC REPORTS. InIn BBBDD FWTTH βbbRR MMmmW Followed by Ice Report (see Hydrogra- Section) NOTES: (1) β is in O.I.C. (2) W"=past weather in Nauen Code Stations: or Riga, 02 Libau, 03 Malnova, 04, Daug- pils, 05 Ventspils, 06 Priekuli En clair message in English
Riga, K.C.A., 600 sp. ..	1100	—	W.	p.l.	
MALTA					SYNOPTIC REPORTS.
Cala Frana, GHA, 4,800 cw.	0740	0700	S.	N.I.C.	(1) BBBDD FwwTT cbWVH ALA RRSVsr MMmm (2) "Pilot" h ₁ ddvv h ₁ ddvv etc. (1) BBBDD FwwTT cbWVH ALANh (2) "Pilot" h ₁ ddvv h ₁ ddvv, etc. (1) BBBDD FwwTT cbWVH ALA RRSVsr (2) "Pilot" h ₁ ddvv h ₁ ddvv etc. Station: Rinella
	—	—	U.W.	"	
	1340	1300	S.	"	
	1840	1800	S.	"	
			U.W.	"	
MADAGASCAR					
Zandzi (Mayotta Is.) FDO ..	See	—	W.	—	This telegram will be preceded and follow by the warning signal ————— repeated at short intervals. If the warn- signal only is sent out it will indicate, in absence of precise information, that there reason to expect the passage of a cyclone.
Majunga FJA	notes				
Diégo Saurez FDG					
(All 600 sp.)					

During the whole of this service the Zaudzi, Majunga and Diégo Suarez stations will remain on the watch, outside the regular hours of working, during the first quarter of each hour, except between 2115 and 0300.

NOTES:

The warning telegram, originating at the Observatory at Antananarivo, will be sent out at the even hours (except between 2100 and

0300), during the probable continuance of the cyclone in the zone within range of the stations, alternately by Zaudzi and Majunga stations in the case of a cyclone affecting the region to the north-west of Madagascar or the Mozambique channel, and alternately by the Zaudzi and Diégo Suarez stations in the case of a cyclone affecting the regions to the north-east and east of Madagascar.

	(1)	(2)	(3)	(4)	(5)	(6)
MEXICO						
Mazatlan de Sinaloa XAE ..	1837	—	—	—	—	—
Salina Cruz XAN ..						
Payo Obispo XAC ..						
Campeche XAB ..						
Vera Cruz XAA ..						
(600 sp.)						
MOROCCO						
Médiouna, CNM, 5,000 c.w.	0200	0100	S.	French Met. Code		
			O.	"		
	0800	0700	S.	"		
			U.W.	"		
			O.	"		
	1400	1300	S.	"		
			O.	"		
	1900	1800	S.	"		
			O.	"		

SYNOPTIC REPORTS.	
(1) "Météo Rabat" (03, 07, 31, 32, 61) In	BBBT cbbP DDFNV
(2) "Navires" Q'LLLx ₁ , Plllx ₂ BBDD	FvKdx ₄ wwGGx ₅ y ₁ y ₂ y ₃ y ₄ z
(Ob. from ships in the Western Medi-	
tanean are given in the form InIn PQ'L	
lllGG BBDDF w ₃ W ₃ vSN ₁ A ₁ n'a ₁ b ₁ b ₁ . (
under French Synoptic Reports). Ships us-	
ing this code have index numbers from 50 upwa-	
(1) "Météo Rabat" (01-15) InIn BBB	cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ mmR
(index number and first three groups only	
stations 07, 15)	
(2) "Pilot" InInGG ddf ddf ddf, etc.	
(3) Same form as Part (2) of 0200 mess-	
(1) "Météo Rabat" (01-69) InIn BBB	cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂
(2) Same form as Part (2) of 0200 mess-	
(1) "Météo Rabat" (01-69) InIn BBB	cbb(SV _s) DDFNV ddF'nh w ₁ w ₁ PA ₁ A ₂ MMt
(2) Same form as Part (2) of 0200 mess-	

OROCCO—contd.

NOTES: (1) See under French Meteorological Code and Eiffel Tower Synoptic (pages 0000) for details of code.
(2) Stations 07 and 15 send index number and first three groups only of "surface" ob.

STATIONS:

TANGIER	13	Marrakesh	36	Ouargla	44	El-Oued	66	Ben Gardane
RABAT	14	Midelt	37	In-Salah	45	Ghardaïa	67	Susa
Casablanca	15	BU DENIB	38	Colomb-Béchar	46	Adrar	68	Metlaoui
Mogador	31	ORAN	39	Béni-Abbès	61	TUNIS	69	Qabes
AGADIR	32	ALGIERS	40	Timimoun	62	BIZERTA	80	Funchal
Meknes	33	SETIF	41	Laghwat	63	Sfax	81	Angra
FEZ	34	BISKRA	42	Aïn-Sefra	64	Medinine	82	St. Etienne
Taza	35	Touggourt	43	El-Goléa	65	Tozeur	83	Dakar
Ujda								

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
NEW HEBRIDES					
Fila HNV, 600 sp. ..	—	—	—	—	Weather reports for Fila and Numea (see under Apia, Pacific Islands)
Numea FQN, 600 sp. ..	—	—	—	—	do. do. do.
NEW GUINEA					
Port Moresby VIG, 600 sp.	request	—	F.	—	Forecasts transmitted when requested by ships or when necessary.
Samarai VIJ, 600 sp. ..	—	—	—	—	
NEWFOUNDLAND AND LABRADOR					
Stape Race VCF, 600 sp. ..	0215 1415 request	—	F.	p.l.	Compiled by the Canadian Meteorological Service, Toronto.
Point Amour VCL ..	request	—	—	—	
Belle Isle VCM ..	0230 1430 request	—	F.	p.l.	Compiled by the Canadian Meteorological Service Toronto
NEW ZEALAND					
Awanui VLA ..	1000	—	F.W.	—	See under Apia, Pacific Islands, for details
(600 sp.)					Storm warnings issued by Apia (Pacific Islands) are sent immediately after weather report
Wellington VLV ..	0930	—	F.	—	These reports are not sent Sat. or Sun. unless the conditions are exceptional
Awarua VLB ..	0900	—	—	—	
Chatham Islands VLC ..	—	—	—	—	
NORWAY					SYNOPTIC REPORTS.
Christiania, LCH, 8,000 c.w.	0750	0700	S.	N.I.C.	"Météo Norvégien"
		0700	S.	"	(01) InIn ^{tt} BBBDD FwwTT cbWVH ALANh RRrsFm
		"	"	"	(90) InIn BBBDD FwwTT cbWVH ALANh RRmmr C ₁ ddVV
		"	"	"	(32) InIn BBBDD FwwTT cbWVH ALANh RRSVsr C ₁ ddVV
		"	"	"	(Other stations) InIn BBBDD FwwTT cbWVH ALANh RRSVsr
		"	U.W.	"	"Pilot" (97, 98, 99) InIn h ₁ ddvv h ₁ ddvv, etc.
		"	O.	"	PQLLL MGG BBDDF wwVKd ALANF _m
	1350	1300	S.	N.I.C.	dsdsrsW TTTHc btttt
		"	"	"	(32, 90) InIn BBBDD FwwTT cbWVH ALANh C ₁ ddVV
		"	"	"	(Other stations) InIn BBBDD FwwTT cbWVH ALANh
		"	U.W.	"	As for 0750 message above
		"	O.	"	As for 0750 message above
	1850	1800	S.	N.I.C.	(90) InIn BBBDD FwwTT cbWVH ALANh RR — r C ₁ ddVV
		"	"	"	(32 and other stations) as for 0750 message above
		"	U.W.	"	As for 0750 message above
		"	O.	"	

NORWAY—contd.

NOTES: (1) Stations, 05, 30, 59, 70, 82, are not transmitted regularly but only when normal stations are missing.

(2) or Maud is only transmitted during the Polar night. The geographical position of the "Maud" is given from time to time. Reports from Swedish and Norwegian ships are included in these messages.

(3) Special Codes:

Fm = max. wind force since time of previous ob. Code fig. 0 = Beaufort No. 10, 1 = 11, 2 = 12, 3 = 0 to 3, 4 = 4, etc.

dsds = Ship's course on scale 01-32 (08 = E, etc.)

s = time of cessation of precipitation on same scale as for commencement in N.I.C. where 0 = no rain or rain still falling.

bb = amount of bar. tendency in half mbs. during preceding 3 hr. with addition of 50 to indicate negative tendency

Stations: or, ss. "Maud" (Amundsen's Polar Expedition), 02 Quade Hook (C), Spitzbergen; 05 Green Harbour (C), Spitzbergen; 10 Ingoy (C), 12 Tromso; 22 Valdersund (C); 27 Kinn (C); 30 Okso (C); 32 Lister (C) 35 Bjornoya (C), 40 Audenes (C), 42 Rost (C), 47 Jan Mayen (C), 55 Faerder (C), 59 Runde (C), 60 Vardo (C), 70 Brounoy (C), 80 Utsire (C), 82 Skudesnes (C), 90 Dombaas (L) Pilot Balloon Stations: 97 Bergen, 98 Tromso, 99 Aas

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Jan Mayen, JN, 1,000 sp. . .	(2) 0710 1310 1810	(3) 0100 0700 1300 1800	(4) S.U.W. " W.	(5) — — p.l.	(6) SYNOPTIC REPORTS. Storm warnings issued as necessary. "POLAR FRONT" REPORTS "Météo"
Bergen, LGN, 1,850 c.w. (repeated on 600 sp. and R/T.)	0950 2050	0700 1800	S. S. W.	— — —	

(1) "Situation" BBK'D'D' FILLI gives the more important depressions over North-west Europe and the North Atlantic.

BB = barometric pressure, in whole millibars in the centre of the depression or anti-cyclone. (Initial figures, 9 or 10, omitted)

K¹¹ = probable variation of barometric pressure (see Table I)

D'D' = direction from which centre is moving (scale 00-32). When a depression is referred to 50 is added to the number

F¹ = speed of movement of centre (the scale taken being a degree of lat. at the Equator per 12 hours; 9 indicating any speed over 8 degrees)

LL = Lat. (N.) of the centre

11 = Long. (for Long. E. of Greenwich 50 is added to the number)

The word "central" indicates that the two succeeding groups describe an extensive stationary depression, which will determine the wind currents in its vicinity for several days

(2) "Fronter" NNnf

gives information relating to the "Polar Front" and "Families of Cyclones"

NN = index number of "family" (counting from the beginning of the year)

n = index number, in the "family," of the member described in the succeeding groups, scale 1-9, generally followed by a break through of "polar air" and the formation of an anti-cyclone. X = number not yet determined f = the "front"

Following this group are two or more groups of the form F'LLl, which relate to points on the "front." If several are given the information is separated by the "break sign" (— • • • —)

(3) "Veirvarsler," followed by forecasts *en clair* (Norwegian) for four sections of the

west coast of Norway from Lindesnes (The Naze) to Leka (near Bronnøy)

(4) "Stormvarsler," followed by storm warnings *en clair* (Norwegian), when the wind exceeds Beaufort force 7, for the same areas as Part III. When the force is unlikely to exceed 6, or is likely to decrease without change of direction, the words "Stormvarsler Ingen" are transmitted

SPECIAL CODES. Table I.—(K¹¹).

Probable variation of pressure in the centre of a depression or an anti-cyclone during the ensuing 12 hours.

Code	
0	pressure will remain almost constant.
1	will rise slowly
2	rise
3	will rise rapidly
4	Do. very rapidly
5	will fall slowly
6	fall
7	will fall rapidly
8	Do. very rapidly
9	Do. abnormally
x	no determination possible

Table II.—(f)

Character of the most noteworthy "front" in the system NNn

Code	
1	not very well marked
2	well marked
3	very pronounced
4	violent
5	not very well marked
6	well marked
7	very pronounced
8	not very well marked
9	well marked
0	very pronounced

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
NORWAY—contd.					SYNOPTIC REPORTS.
	0755	0700	S.	N.I.C.	" Kystmet " (Météo Côtière)
Bergen, LGN, 600 sp. ..	1855	1800	S.	"	InIn VLVS- DDFww
					NOTE.—VL = visibility towards the coast
					Stations :—
					Titran 49, Hustad 54, Runde 59, Bulandet 64, Byrknesy or Hellisoe 69, 74, Utsira 80, Lindesnes 89
					SYNOPTIC REPORTS.
	0715	0700	S.	N.I.C.	BBBDD FwwTT cbWVH ALaNH
Ålesund, LDW, 1,800 sp. ..	1315	1300	S.	"	RRSVsr BBBDD FwwTT cbWVH ALaNH
	1815	1800	S.	"	RRMMr BBBDD FwwTT cbWVH ALaNH
					RRmmr
					Stations :—Jan Mayen, Rost
		0100	S.U.W.	—	—
North-east Greenland, NEG, 1,450 c.w.		0700	"		
		1300	"		
Narsarsuaq Hook (Spitzbergen) 800 c.w.		1800	"		
Green Harbour (Spitzbergen) LFG, 1,000 sp.					
Naar Island, LWP, 1,200 sp.					
PACIFIC ISLANDS					
Tonga Islands					
Nukualofa VSB, 600 sp. ..	request	—	F.	p.l.	Local forecast (<i>en clair</i>)
					NOTE : The station also transmits a weather report, together with that of Vavau, to Apia at 2130 (0415 and 2130 during hurricane season containing barometric pressure corrected, dry and wet bulb thermometers, wind direction and force (Beaufort), and amount of sky clouded (scale 0-10), as follows :— 2990 78 76 SE 5 10
Cook Islands					
Rarotonga VMR, 600 sp. ..	—	—	—	—	—
Samoa Islands					
Futuila NPU, 2,255 sp. ..	0330 0730 2330	— — —	— — —	— — —	Local weather reports preceded by the letter " T "
Apia VMG, 2,000 sp. ..	—	—	—	—	

PACIFIC ISLANDS—contd.

SOUTH PACIFIC OCEAN: WEATHER REPORTS

1. An exchange of weather conditions between various islands in the South Pacific now takes place, Apia being the central station for the collection of reports. The observations are made at 0330 G.M.T. (civil) for the p.m. message throughout the year; and at 2030 G.M.T. during the hurricane season for the a.m. message. The following is the procedure for the interchange of reports:—

2. The actual message will consist of:—

- (a) Station from which report emanates, *i.e.*, Apia, Suva, Nukualofa, Norfolk Island, Fila, Awanui, Numea and Vavau
- (b) Barometer (corrected for temperature and height) in inches
- (c) & (d) Thermometer, dry and wet bulb as read respectively, *e.g.*, 80 79
- (e) & (f) Wind, direction (true) and force (Beaufort), as read, *e.g.*, E.N.E. 3
- (g) State of sky and weather in Beaufort notation
- (h) G.M.T. at which observations were made, if not in accordance with para. 1

The station broadcasting weather reports makes each report successively; break sign (— • • • —) separates each report

Example—

Apia 30 16 80 79 E.N.E. 3 BC (Break sign)
Suva 30 08 79 78 E.N.E. 5 OCR (Break sign)
Nukualofa Fila Numea
Norfolk Island Awanui Vavau, etc.

3. Owing to the inability of some of these islands to intercommunicate direct and having to relay through, the following routine is to be observed

(a) During the Hurricane Season

(i) Fila exchanges weather reports with Numea in time to enable the former to transmit both reports to Suva at a prearranged hour

Nukualofa sends its weather report, together with that of Vavau, to Apia at 2130 and 0415 G.M.T.

Suva passes to Apia at 2200 and 0815 G.M.T. the weather reports from Suva, Norfolk Island, Fila and Numea. The times for Norfolk Island and Fila being arranged by Suva

Awanui passes to Apia the New Zealand barometer, wind and weather, at a time mutually arranged, in the same words as broadcasted nightly

Rarotonga is not included in the scheme, but listens for Papeete; if there are indications of an atmospheric disturbance at Rarotonga, that station transmits a message, as indicated in para. (2), to Apia

Papeete transmits weather report to Apia at 0430 G.M.T., throughout the year, using the numerical code

(ii) These reports are collected by Apia, and, together with Apia's own weather report, will be broadcasted by Apia at the times laid down in para. 3 (iii) for all ships and stations. If there are signs of an atmospheric disturbance Apia will make the call sign for "all ships" (QST) and distribute the necessary information in addition, *e.g.*:—

Hurricane centre 200 miles N.W. of Suva at noon, 27th February, Apia time and date, travelling south

(iii) When issued the data and warnings (if any) will be made at 2330 and 0830 G.M.T., followed by the time (either 0330 or 2030 G.M.T.) that the observations were taken: Apia broadcasting first on 2,000 metres, Suva repeating on 600 metres. If Apia issues a warning, Awanui broadcasts it immediately after the routine New Zealand weather report, and informs the Meteorological Office, Wellington

(b) At times other than the Hurricane Season

(iv) The same procedure is followed as in para. 3 (i), omitting the a.m. observations and times, Apia and Suva broadcast the information as laid down in para. 3 (iii) at 0830 G.M.T. only

NOTE.—The hurricane season in connection with these arrangements is to be considered as from 1st November to 30th April inclusive

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) Papeete (Tahiti) FOP 600 sp.	(2) 1100 2300	(3) —	(4) S. W	(5) O.I.C. p.l.	(6) "Tahiti observatoire" BBBBDD FWu "Tahiti TTT" followed by advice cyclones, typhoons, etc. NOTES: (1) Reports refer to ob. mad Point Venus (2) Weather reports are transmitted times in succession, the first time rapidly second and third times slowly (3) Storm warnings repeated three times with intervals of ten minutes (4) Missing figures are replaced by "
PANAMA					
Colon, NAX, 1,621 sp.	1000* 1800*	—	—	—	—
Balboa, NBA, 2,400, 7,000 arc	1000 1800	—	—	—	—
PHILIPPINE ISLANDS.					
Cavite NPO, 2,250 sp., 5,000 arc	0155* 1355*	—	—	—	—

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
OLAND					
Warsaw, WAR, 2,400 sp. . .	0215	0100	S.	N.I.C.	SYNOPTIC REPORTS. "Météo Pologne" In In BBBDD FwwTT cbWVH ALaNh
	0815	0700	S.	N.I.C.	(1) InIn BBBDD FwwTT cbWVH ALaNh RRmmr
			U.W.	special	(2) "Pilot" InIn d'd'v'v'd' d'v'v'd'd'— v'v'd'd'v' v'd'd'v'v' d'd'v'v'
	1415	1300	S.	N.I.C.	(1) as for (1) 0215 message above
	1915	1800	U.W.	special	(1) " " (2)
			S.	N.I.C.	InIn " BBBDD FwwTT cbWVH ALaNh RRMMr
NOTES: (1) For the Aerial Line, Paris-Stras- bourg-Prague-Warsaw-Bucharest, aerial route reports and forecasts are added to the above messages. (2) Upper winds are reported at the following six heights in order: 500 m., 1,000 m., 1,500 m., 2,000 m., 3,000 m., 4,000 m. d'd' = direction of U.W. on scale 01-32 as for surface wind v'v' = speed of U.W. in metres/sec.					
Stations:—					
01 Posen (L)	09 Kielce (L)	17 Konitz (L)	24 Luck (L)		
02 Warsaw (L)	10 Bromberg (L)	18 Graudenz (L)	25 Brest-Litovsk (L)		
03 Vilna (L)	11 Zakopane (L)	19 Thorn (L)	26 Bjelovjeoch (L)		
04 Lodz (L)	12 Pinsk (L)	20 Teschen (L)	27 Suvalki (L)		
05 Lublin (L)	13 Neufahrwasser (C)	21 Przemyśl (L)	28 Baranovitschi (L)		
06 Cracow (L)	14 Oxhöft (C)	22 Sniatyn (L)	29 Tourmont (L)		
07 Tarnow (L)	15 Hela (C)	23 Rovno (L)	30 Bialystok		
08 Lemberg (L)	16 Rixhöft (C)				
PORTO RICO					
San Juan, NAU, 600 sp.,	0200	0000	S.	—	" U.S.W.B. (United States Weather Bureau) American InIn (or In) BBBDF
4,850 c.w.	0200		W.	p.l.	Hurricane warning <i>en clair</i>
	1500				NOTE.—(1) In the absence of a tropical storm, the words "weather normal" will be sent each day. (2) x = missing ob. (3) Messages transmitted from June to November (inclusive) (4) If the anticipated meteorological con- ditions are reported normal, the message "weather normal" will be sent (5) When storm or hurricane conditions are indicated, information relating to location, direction of movement, and progress of the storms are added. Warnings and advices covering a hurricane that has been announced also are broadcasted at intervals until the danger has passed. The broadcasts are made first on a length of 600 metres, with an im- mediate repetition on 5250 metres Stations: SJ San Juan, ST St. Thomas (Virgin Is.), BT Basseterre (St. Kitts), RS Roseau (Dominica), BB Bridgetown (Barba- does), SD Santo Domingo, SL Puerto Plata, LU Castries (St. Lucia), W Willemstadt (Curaçao), PS Port of Spain (Trinidad) This station repeats the message transmitted from San Juan NAU (above) for the benefit of shipping and others equipped with wireless telephone. The reports are transmitted both in English and Spanish These messages are only sent when a storm or hurricane is in progress over the eastern half of the Caribbean Sea, from the Windward Islands westwards to San Domingo. The reports are sent in both English and Spanish
San Juan, WKAQ, 360 R/T.	0100				
	1400		W.	p.l.	
	1800		W.	p.l.	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
PORTUGAL					SYNOPTIC REPORTS.
Monsanto, CTV, 1,000 sp. (messages are repeated 5 mins. after scheduled time on 2,400 c.w.)	0945	0700	S.	N.I.C. and special	<p>"Météo Portugal"</p> <p>(1) (Name of ob. station <i>en clair</i>). BBBD FwwTT cbWVH ALANh RRmmr "mar" pD₁D₁kθ</p> <p>The final group is a special code preceded by the word "mar" giving the state of the sea the symbols having the following meanings:—</p> <p>p = period of swell in seconds. O = 1 seconds or more</p> <p>D₁D₁ = direction from which swell comes (Scale 01-32, as for surface wind.)</p> <p>k = height of swell on a progressive sea (0-9)</p> <p>θ = tendency of swell at time of observation</p> <p>0 No change 7 Increasing slowly 1 decreasing slowly 8 increasing 2 decreasing 9 increasing rapidly 3 decreasing rapidly</p>
			O.	N.I.C.	(2) "Navires" PQLLL IIIIGG BBDD
	2130	1800	S.	N.I.C. and special	<p>(1) (Name of station <i>en clair</i>) BBBD FwwTT cbWVH ALANh RRMMr "mar" pD₁D₁kθ</p>
			O.	N.I.C.	(2) Same form as (2) of 0945 message above
					Stations: Lisbon, Oporto, Coimbra, Funchal, Angra
					NOTE.—All land stations are treated inland stations <i>i.e.</i> , max. and min. temp. are given in all cases in the fifth data group
Monsanto, CTV, 600 sp. (messages repeated 5 mins. afterwards on 2,400 c.w.)	1430	0700	S.	p.l.	<p>Message <i>en clair</i>, in Portuguese giving:</p> <p>(1) General pressure distribution at 0700</p> <p>(2) State of weather at 0700 along the coast of Portugal, Azores, Madeira, Straits Gibraltar, and Bay of Biscay</p>
Terceira (Faleiras), PQT, 1,000	1330	1300	S.	N.I.C.	(Station <i>en clair</i>) BBDDx ₁ FwwH cbWVx ₃ CNTTx ₁ KdGGx ₅ y ₁ y ₂ y ₃ y ₄ Z
	1830	1800	S.	"	(Station <i>en clair</i>) BBDDx ₁ FwwH cbWVx ₃ CNMMx ₁ RRSrx ₅ KdGG y ₁ y ₂ y ₃ y ₄ Z
					Stations: Angra, Horta, Ponta Delgada
PORTUGUESE EAST AFRICA					
Lourenço Marques, CRZ, 600 sp.	0800* 1900*	0700 1845	— —	p.l. p.l.	<p>Report received from Observatory "Camp Rodrigues"</p> <p>Plain language message giving details the following order:—</p> <p>(1) Atmospheric pressure in millimetres</p> <p>(2) Direction of wind</p> <p>(3) Wind force according to Beaufort Scale</p> <p>Example: Here at 8 a.m. G.M.T. (or 7 p. G.M.T.), sea level pressure 780 m.m. E., gen breeze</p> <p>This report or further meteorological information from Observatory given by request of of charge</p>

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
ROUMANIA.					
Bucharest, BUC, 5,800 c.w.	0150	0100	S.	N.I.C.	SYNOPTIC REPORTS. "Météo Bucuressti"
					(01 only) BBBDD FwwTT cbWVH ALaNH
	0845	0700	S.	N.I.C.	(or) BBBDD FwwTT cbWVH ALaNH RRmmr
		0600	S.	O.I.C.	(02-15) InIn BBBDD FWTTR
		0500- 0600	U.W.	N.I.C.	(01 only) h ₁ ddvv h ₁ ddvv, etc.
	1350	1300	S.	N.I.C.	As for 0845 message above. (U.W. ob. made between 0600 and 0800)
	1850	1800	S.	N.I.C.	(01 only) BBBDD FwwTT cbWVH ALaNH RRMMr
					Stations:— 01 Bucharest 06 Piatra 11 Sibiu 02 Craiova 07 Sulina 12 Turnu 03 Bolgrad 08 Constantza 13 Severin 04 Kishinev 09 Tecuci 14 Caransebes 05 Czernowitz 10 Ramnicu 15 Jassy Sarat
RUSSIA.					
Petrograd (Nouvelle-Hollande) RAC, 1,600 sp.	0905 1715	1800 0700	S. S.	O.I.C. O.I.C.	BBBDD FwTTW BBBDD FwTTW
					NOTE.—These are collective reports of Russian and European Ob.
Moscow, RAI, 5,000 sp. ..	2210	0700	S.	O.I.C.	(Ob. Station and day of week) BBBDD FwTTT BBBDD FwTTT bbbRR (or βbbRR)
Archangel, RCE, 1,800 ..	1300	—	—	—	—
Archangel, RQA, 600 sp. ..	1500- 1600 (approx)	—	S.F. I.	p.l.	Weather bulletin containing the direction and force of the wind; followed in summer by a forecast for the ensuing 24 hours for the White Sea and the Murman coast, and in winter by a report concerning ice conditions in the White Sea from Syvatoi Nos to Modyugski
Vladivostock, RAS, 1,500 ..	1512	—	S. W.	— p.l.	•

(1) (Station *en clair*) BBBDDF

(2) General atmospheric conditions and the positions of the centres of typhoons and depressions with their probable direction. The message will include information giving the positions of centres of typhoons and cyclones, together with their tracks and anticipated movements

In case of the special receipt of a warning of an approaching typhoon (or cyclone) the Vladivostok Naval Observatory broadcasts a warning message giving brief particulars as regards the position of the centre of the typhoon (or cyclone), its direction and movement, and the region threatened

Stations: Vladivostok Naval Observatory transmits daily to vessels at sea meteorological observations taken at:

Anadir	Shanghai
Naiakhon	Amoy
Petropavlovsk	Hong Kong
Okhotsk	Nemori
Nikolaevsk (or Jhenkier)	Hakodate
Kharbarovsk	Tokyo
Manchuria	Nagasaki
Harbin (or Tsitsikar)	Nacha
Vladivostok	Ishigaki
Fusan	Bonin
Mukden	Manila

Country, Station, Call, Wavelength	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
RUSSIA ⁽¹⁾ <i>cont'd.</i>	(2)—	(3)	(4)	(5)	(6)
	1030				
Khabarovsk, RO, 1,500 ..	1542	—	S.	—	As for 1512 message from Vladivostok
Petropavlovsk, RPK, 2,000	1642	—	S.	—	Do. do. do.
SYNOPTIC REPORTS.					
Sevastopol RCT, 2,500 ..	0600	2100 (L.T.)	S.	N.I.C.	"RCT Météo Sevastopol" (date) BBBDD FwwTT (Name of station <i>en clair</i>) BBBDD FwwTT bbbRR
	0600	0700 L.T.	S.	"	
	1200	—	S. I.	— p.l.	(Date and name of station <i>en clair</i>) BBBDD FwTTT bbbRR. Followed by state of sea and ice conditions <i>en clair</i>
NOTES: (1) The 1200 message is a collective report for the Black Sea and Sea of Azov (2) Missing ob. are replaced by "x"					
Stations: Sevastopol, Eupatoria, Yalta, Kertch, Taganrog, Taupe					
SERBS, CROATS AND SLOVENES					SYNOPTIC REPORTS
Belgrade, HFB, 4,600 c.w.	0740	0700	S.	N.I.C.	"Météo SHS" InIn BBBDD FwwTT cbWVH ALAN RRmmr CiddVV
	1330	1300	S.	"	InIn BBBDD FwwTT cbWVH ALAN CiddVV
	1830	1800	S.	"	InIn BBBDD FwwTT cbWVH ALAN RRMMr CiddVV
Stations: — 01 Belgrade, 02 Crikvenica, 03 Sarajevo, 04 Zagreb (Agram)					
SOUTH AFRICA					
Capetown, VNC	1115	—	F	p.l.	<i>En clair</i> message of forecast of weather of the coast of the Union of South Africa
Durban, VND	1100	—	F	"	Do. and also local weather at Durban
Port Elizabeth, VNQ, ..	1130	—	F	"	Do.
All 600 sp.					
Walvis Bay, VNV, 600 sp. ..	1300 2000	—	—	—	General weather report
SPAIN					SYNOPTIC REPORTS.
Carabanchel (Madrid), EGC, 2,000 sp.	0930	0700	S.	N.I.C. (mod.)	"SME" (SF, LC, MA) InIn BBBDD Fw ₁ w ₁ T c ₁ bbRR C ₁ d ₁ C ₂ d ₂ u
			U.W.	"	d ₁ d ₁ v ₁ v ₁ d ₁ d ₁ v ₁ v ₁ , etc.
			S.	"	(Other stations) InIn BBBDD Fw ₁ w ₁ T C ₁ bbRR C ₁ d ₁ C ₂ d ₂ Nh
			U.W.	"	d ₁ d ₁ v ₁ v ₁ d ₁ d ₁ v ₁ v ₁ , etc.
	1530	1300	S.	"	(SF, LC, MA) InIn BBBDD Fw ₁ w ₁ T c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₂ d ₂ u
			S.	"	(Other stations) InIn BBBDD Fw ₁ w ₁ T c ₁ bbW ₁ W ₁ C ₁ d ₁ C ₂ d ₂ Nh
			W.	special	"Precaución" Ci LL GG BB or "Pre- caución" Gr LL GG BB DD
	2030	1800	S	N.I.C. (mod.)	Same as for 0930 message above but contain no upper air ob.

PAIR—contd.

NOTES: (1) Special codes:—

- w_1w_1 = present weather
 c_1 = characteristic of barometric tendency
 C, C_2 = forms of cloud to which d_1 and d_2 refer
 Nh = cloudiness of horizon
 d_1d_1 = direction of upper wind
 v_1v_1 = speed of upper wind
 d_1 = direction of motion of low cloud (scale 0-9, 0 = no cloud; 1 = from N.E.; 2 = from E., etc. 9 = no observation)
 d_2 = direction of motion of high cloud on same scale as d_1
 bb = amount of barometric tendency (millibars and tenths per three hours)
 u = sea disturbance in Old International Code (page 393)

The remaining symbols have the same significance as in the New International Code. If a figure is missing from a set of observations, the letter "x" is inserted in its place

If a complete set of observations is missing the word "falta" is transmitted after the index letters of the station.

Characteristic of Barometric Tendency (c_1)

- Code
0 Steady
1 Rising
2 Rising then steady
3 Rising then falling
4 Falling or steady, then rising
5 Falling
6 Falling then steady
7 Falling then rising
8 Rising or steady, then falling
9 Line squall

Form of High Cloud (C_2)

- Code
0 No high cloud
1 Cirrus
2 Cirro-stratus
3 Cirro-cumulus
4 False cirrus
5 Thin alto-stratus
6 Thick alto-stratus
7 Alto-cumulus (low)
8 Alto-cumulus (high)

Form of Low Cloud (C_1)

- Code
0 No low cloud
1 Fracto-cumulus
2 Mammato-cumulus
3 Low strato-cumulus
4 High strato-cumulus
5 Nimbus
6 Cumulus
7 Cumulo-nimbus
8 Stratus
9 No observation

Cloudiness of Horizon (N.)

- Code
0 All the horizon without cloud
1 Clouds in the North part of the horizon
2 Clouds in the East part of the horizon
3 Clouds in the South part of the horizon
4 Clouds in the West part of the horizon
5 All the horizon covered with clouds except the first quadrant
6 All the horizon covered with clouds except the second quadrant
7 All the horizon covered with clouds except the third quadrant
8 All the horizon covered with clouds except the fourth quadrant
9 All the horizon covered with cloud

Upper Winds ($d_1d_1v_1v_1$)

These are reported by five groups each of the form $d_1d_1v_1v_1$, referring respectively to the five heights 250, 500, 1000, 2000, and 3000 metres.

d_1d_1 = wind direction (scale 01-32; where 08 = E.; 16 = S.; 24 = W.; 32 = N.)

v_1v_1 = velocity of wind in metres per second

(2) (W). *Special Code*.—The storm warnings preceded by the word "precaución" followed by either the letters CL (indicating cyclonic depression) or Gr (indicating a squall). Where LL = lat. in degrees of the centre of the depression, GG = longitude (50 is added to the number for longitudes East of Greenwich) of the centre of the depression, BB = barometer in mb.; DD = direction in which squall is proceeding (scale 0-32)

Stations:—

MD	Madrid	CD	Cordova
LC	Corunna	AI	Alicante
SF	San Fernando	AL	Almeria
BA	Barcelona	ME	Melilla
SA	Santander	TE	Tetuan
VD	Valladolid	IZ	Izana (Tenerife)
ZA	Saragossa	BI	Bilbao (Algorta)
MA	Mahon	MG	Málaga
BD	Badajoz	VA	Valencia
LA	Larache	SE	Seville

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
SWEDEN					SYNOPTIC REPORTS.
					"Météo Sude"
Karlsborg SAJ, 4,200 cw. ..	0740	0700	S.	N.I.C. (mod.)	(1) (03) InIn BBBDD FwwTT cbWVH ALANh RRmmr C ₁ ddVV
					(2) (Other stations—inland) InIn BBBDD FwwTT cbWVH ALANh RRmmr
					(Other stations—Coastal) InIn BBBDD FwwTT cbWVH ALANh RRSVsr
			U.W.	"	(3) "Pilot" (03, 22, 37) InIn h ₁ ddvv h ₁ ddvv, etc.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
SWEDEN— <i>contd.</i>	1340	1300	S.	N.I.C. (mod.)	(1) (03) InIn BBBDD FwwTT cbWVH ALaNh C ₁ ddVV
					(2) (Other stations) InIn FBBDD FwwT cbWVH ALaNh
			U.W.	"	(3) "Pilot" as for 0740 (3) message above
	1840	1800	S.	N.I.C.	As for 0740 (1) and (2) message
					NOTES: (1) Stations in capitals are also transmitted normally. Should any be missing others from the list are inserted.
					(2) VV—Speed is given in metres per sec
					(3) Observations of upper air temperature and humidity transmitted at the end of the Swedish synoptic messages are in the code:

Stations:

01 Karesuando (L)	36 KARLSTAD (L)
02 Riksgränsen (L)	37 STOCKHOLM (L)
03 ABISKO (L)	38 Örebro (L)
04 Kiruna (L)	39 Strömstad (L)
05 Suorvajaure (L)	41 Åsersund (L)
07 Gällivare (L)	42 Nyköping (L)
09 Jockmock (L)	44 Linköping (L)
11 HAPARANDA (L)	45 Skara (L)
14 Piteå (L)	46 Vänersborg (L)
15 STENSELE (L)	47 Ulricehamn (L)
16 Gäddede (L)	48 JONKÖPING (L)
19 Umeå (L)	49 Västervik (L)
21 Storlien (L)	50 Borås (L)
22 ÖSTERSUND (L)	51 Göteborg (L)
24 HARNOSAND (C)	52 WISBY (C)
26 Svea (L)	55 Växjö (L)
27 Bjuraker (L)	57 Halmstad (C)
28 SARNA (L)	58 KALMAR (C)
30 Gävle (L)	59 Karlshamn (C)
31 Falun (L)	61 Kristianstad (L)
32 Gustafsfors (L)	62 Lund (L)
34 Uppsala (L)	63 Malmö (L)
35 Västeraås (L)	65 Bjuröklubb (C)
	78 Ölands Norra Udde (C)

GGU₁U₂ OOTTT PPBBB HHTTT PPBBB
where GG = Hour of observation (G.M.T.)

U₁ and U₂ are to be decoded as follows:—

U₁ 5 = kite ascent

6 = captive balloon ascent

7 = aeroplane ascent

8 = balloon-sonde ascent

U₂ 3 = observations during ascent

4 = observations during descent

5 = mean of observations during ascent
and descent

6 = no indication whether data relate to
ascent or descent

8 = observations uncertain

HH = height above sea-level in hundreds
of metres

TTT = corresponding temperature in
degrees and tenths Centigrade

PP = corresponding relative humidity
(99 = 100 per cent.)

BBB = corresponding pressure in whole
millimetres

The second and third groups (OOTTT
PPBBB) relate to conditions at the level of
the station

The stations concerned are:—

44 Malmöslätt 58° 25' N. 15° 32' E., altitude
115 m.

05 Porjus 66° 55' N. 19° 45' E., altitude
365 m.

(1)	(2)	(3)	(4)	(5)	(6)
Karlsborg SAJ, 2,500 c.w....	1215*	0700	S.	N.I.C.	SYNOPTIC REPORT issued by the Statens Meteorologisk-Hydrografiska Anstalt (Stock- holm) (1) "Weather Report" (station letter BBBDD FVTTT (2) Bar-pressure and changes in Europe <i>en clair</i> (English) (3) "Forecasts" ddynt ddynt, etc. (4) "Gale warning" g ₁ g ₂ g ₃ g ₄ g ₅
	—	0700	S.	p.l.	
			F.	special	
			W.	"	

SWEDEN—contd.

NOTES: (1) V = State of sky or weather (W in O.I.C.)

(2) Stations and code letters for part (1) of message—(Rost (R), Kinn (K), Utsire (U) Hanstholm (Hm), Vinga (V), Hammershus (Bornholm) (Hs), Gotska Sandön (G), Bremö (B)

(3) Forecasts in part (3) refer to the following areas:

N = Eastern portion of North Sea

V = West Coast of Sweden.

Oe = Baltic

B = Gulf of Bothnia

(4) dd = Wind direction according to the following code:

Wind.	Direction between—				
	N.-E.	N.E.-S.E.	E.-S.	S.E.-S.W.	S.-W.
Light	01	06	11	16	21
Moderate	02	07	12	17	22
Fresh	03	08	13	18	23
Strong	04	09	14	19	24
Storm	05	10	15	20	25

Wind.	Direction between—			
	S.W.-N.W.	W.-N.	N.W.-N.E.	Variable.
Light ..	26	31	36	41
Moderate	27	32	37	42
Fresh ..	28	33	38	43
Strong	29	34	39	44
Storm	30	35	40	45

00 = very light wind or calm.

y = forecast of alteration in the direction or force of the wind as follows:

- | | |
|-------------------------|-----------------------------------|
| 0—No forecast | 5—Shifting to the left |
| 1—Unchanging | 6—Gradually increasing |
| 2—Increasing | 7—Gradually decreasing |
| 3—Decreasing | 8—Gradually shifting to the right |
| 4—Shifting to the right | 9—Gradually shifting to the left |

n = forecast regarding rain, as follows:

- | | |
|--------------------------|---|
| 0—Fair weather | 6—Showers in most places (snow squalls in winter) |
| 1—None or little rain | 7—Showers in several places (snow in winter) |
| 2—Rain in some places | 8—Showers in some places (snow in winter) |
| 3—Rain in several places | 9—Fog probable |
| 4—Rain at most places | |
| 5—Rain everywhere | |

"t" = forecast regarding changes in temperature, according to the following scale:

- | | |
|--------------------------|---|
| 0—Unchanged | 6—About mean temperature (more than 3°) |
| 1—Rising | 7—Below mean temperature (more than 3°) |
| 2—Gradually rising | 8—Probable thaw |
| 3—Falling | 9—Probable frost |
| 4—Gradually falling | |
| 5—About mean temperature | |

x = no information

(5) In part (4) of message, g₁ = Skagerrak, g₂ = Kattegat, g₃ = South Baltic, g₄ = North Baltic, g₅ = Gulf of Bothnia

Scale for g:

- | |
|--|
| 0—No storm warning |
| 1—Gale (7-10 Beaufort) from a direction between north and west. |
| 2—Gale (7-10 Beaufort) from a direction between south and west |
| 3—Gale (7-10 Beaufort) from a direction between north and east |
| 4—Gale (7-10 Beaufort) from a direction between south and east |
| 5—Gale (7-10 Beaufort) without given direction |
| 6—Storm (11-12 Beaufort) from a direction between north and west |
| 7—Storm (11-12 Beaufort) from a direction between south and west |
| 8—Storm (11-12 Beaufort) from a direction between north and east |
| 9—Storm (11-12 Beaufort) from a direction between south and east |

The letter "x" will replace a symbol to indicate missing data

(6) Storm warnings are valid until 0700 G.M.T. the following day

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of obs. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Boden SAI Hernösand SAH Vaxholm SAF Gotland SAE Karlskrona, SAA Göteborg, SAB (All 600 sp.)	request	—	—	p.l.	Bulletins from Central Meteorological Station; charge 6.25 francs (6 kroner), or 9.37 francs for special enquiry. Navigation reports also supplied
Hernösand, SAH, 600 sp.	1655	—	W.	p.l.	Storm warnings <i>en clair</i> (English) for the Gulf of Bothnia
	2155	—	W.	p.l.	

Country, Station, Call, Wavelength	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1) SWEDEN — <i>contd.</i>	(2)	(3)	(4)	(5)	(6)
Vaxholm, SAF, 600 sp.	1650 2150	— —	W. W.	p.l. p.l.	Storm warnings <i>en clair</i> (English) for North and South Baltic
Göteborg, SAB, 600 sp.	1700 2200	— —	W. W.	p.l. p.l.	Storm warnings <i>en clair</i> (English) for Skagerrak and Kattegat
SWITZERLAND					
Lausanne, Champ de l'Air, HB2, 1,100	—	—	F	—	Forecasts from Zurich Ob. are transmitted [Aviation reports are sent on 1,650 met wave]
SYRIA					SYNOPTIC REPORTS.
Djedeide (Beyrouth), UAB, 6,100 c.w.,	0850 1950	0700 1800	S. S.	French Met. Code	"Météo Syrie" $I_n I_n$ BBBTT cbb(S) DDFNV ddF'nh $w_1 w_1 P_1 A_2$ mmRRd [This message is repeated from Bizerta (Tun) at the end of the 0920 message from this station] "Météo Syrie" $I_n I_n$ BBBTT cbb(S) DDFNV. ddF'nh $V_1 w_1 P_1 w_2 V$ MMt ₂ d

NOTE: See under French Meteorological Code and Eiffel Tower Synoptic Reports (pages 718-19) for code details.

STATIONS:

01 DAMASCUS	04 Rakka	07 Homs	10 Rayack	15 DJEDEIDE
02 MUSLIMIE	05 Hasseltje	08 Deraa	11 Ksara	16 LATAKIA
03 DEIR-ES-ZOOR	06 Palmyra	09 Sorveida		

(1) TUNIS	(2)	(3)	(4)	(5)	(6) SYNOPTIC REPORTS.
Bizerta (Sidi-Abdallah), FUA, 5,150 c.w.	0120 0920 1330 1830	0100 0700 1300 1800	S. S. U.W. O. S. S.	French Met. Code " " " " "	(1) "Météo Afrique" (61 only) $I_n I_n$ BBB cbbP DDFNV (1) "Météo Afrique" (01-69) $I_n I_n$ BBB cbb(SV _s) DDFNV ddF'nh $w_1 w_1 P_1 A_2$ mmRR (2) "Pilot" $I_n I_n G G$ ddff ddff ddff, etc (3) "Navires" Q"LLL _x Plll _x BBDl FrKdx ₁ wwGGx ₅ y ₁ y ₂ y ₃ y ₄ z (4) "Météo Syrie" Repeat of 0850 message issued from Djedeide-Levant Synoptic Report (See under Syria, page 0000) (1) "Météo Afrique" (61-69) $I_n I_n$ BBB cbb(SV _s) DDFNV ddF'nh $w_1 w_1 P_1 A_2$ (1) "Météo Afrique" (61-69) $I_n I_n$ BBB cbb(SV _s) DDFNV ddF'nh $w_1 w_1 P_1 A_2$ MMt

NOTES: (1) See under French Meteorological Code and Eiffel Tower Synoptic Reports (pages 718-19) for details.

(2) Stations 07 and 15 send index number and first three groups only of "surface" ob.

STATIONS:

01 TANGIER	13 Marrakesh	36 Ouargla	44 El-Oued	66 Ben Gardane
03 RABAT	14 Midelt	37 In-Salah	45 Ghardaia	67 Susa
04 Casablanca	15 BU DENIB	38 Colomb-Béchar	46 Adrar	68 Metlaoui
06 Mogador	31 ORAN	39 Béni-Abbes	61 TUNIS	69 Qabes
07 AGADIR	32 ALGIERS	40 Timimoun	62 BIZERTA	80 Funchal
09 Meknes	33 SETIF	41 Laghwat	63 Sfax	81 Angra
10 FEZ	34 BISKRA	42 Ain-Sefra	64 Medinine	82 Port Etienne
11 Taza	35 Touggourt	43 El-Goléa	65 Tozeur	83 Dakar
12 Ujda				

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
URKEY	(1)	(3)	(4)	(5)	(6)
smanie (Constantinople), OSM, 7,500 c.w.	0830	0700	S.	French Nat.	SYNOPTIC REPORTS "Météo Consple à Phiséar, Paris." (1) InIn BBBTT cbb(SVs) DDFNV ddfnh w ₁ w ₁ PA ₁ A ₂ mmRRd (2) "Pilot" InIn GG ddff ddff etc. (3) InIn BBBTT cbbP DDFNV (4) InIn BBBTT cbb (SVs) DDFNV ddfnh w ₁ w ₁ PA ₁ A ₂ MMT ₁ T ₁ d
		0100 1800 (previous day)	U.W. S. S.	" " "	
	2000	1300	S.	"	(1) InIn BBBTT cbb(SVs) DDFNV ddfnh w ₁ w ₁ PA ₁ A ₂
Constantinople, IQK 3,000 c.w.	0800	—	—	—	NOTE.—These issues are organised by the French National Meteorological Office Station :—OI Constantinople
URUGUAY.					
errito (Monte Video), CWA, 600	2200	1200	S.	—	The station sends out each day (Sundays excepted) between 2200 and 2300, a bulletin from the National Meteorological Institute containing the following information :— (a) The situation of the centres of atmospheric action in the southern part of the continent, <i>i.e.</i> , in the zone from latitude 22° to the extreme south ; (b) The observations made at 1220 by the Central Observatory, Monte- video, and by the National Service stations ; (c) The more important variations observed from 1220 to 2100. In transmitting the bulletin the International Meteorological Code is employed
U.S.A.					
Atlantic Coast and Great Lakes					Masters of all vessels are reminded that all communications concerning weather should be forwarded to the Weather Bureau, Washington, D.C., and if sent by radio or telegraph should be addressed "Govt. Observer" Under the subject "Weather" should be included all information of a meteorological nature, including reports on barometric pressure, winds, force and direction, and move- ments of all air strata. Forms and instructions for reports can be obtained from the Weather Bureau, Washington, D.C. NOTE : All stations transmit the following messages daily, including Sundays and holidays.
Great Lakes (Naval Radio Station), NAJ, 1,988 sp.	0400 (evening bulletin)	0100	S.	American Code	SYNOPTIC—MAJOR BULLETINS. "USWB" (United States Weather Bureau) In or InIn BBBDF W ₁ bWAC 3D ₁ V ₁ D ₂ V ₂ 4D ₃ V ₃ D ₄ V ₄ , etc. The second part of the bulletin consists of synopsis of general atmospheric pressure distribution, including the locations of High and Low areas, and the barometer readings at their centres ; wind and weather forecasts for the upper Lakes and the lower Lakes ; storm warnings for the Great Lakes and flying weather forecasts for aviation zones Nos. 4, 7, 8 and 10. As for 0430 message (above) As for 0430 message (above) As for 0430 message (above)
(From 15th April to 20th Dec. inclusive)			U.W. F.	" p.l	
	1545 (morn- ing bulletin)	1300	S. U.W. F.	American Code p.l.	

U.S.A.—*contd.*

NOTES : (1) Stations which include upper air ob. in both messages are marked * in the list of stations ; those at which upper air ob. are included in the 0430 evening message only are marked † ; those which include only first group barometer, wind direction and velocity are marked ‡

(2) When upper air observations are not possible because of dense fog, rain or snow, the word FOGGY, RAIN or SNOW, as the case may be, will be sent instead of the third group

(3) The second part of the bulletin is in plain language and consists of a synopsis of general pressure distribution wind and weather forecasts ; storm warnings ; and flying weather forecasts by zones (Lakes Superior, Michigan and Huron, Lakes Erie and Ontario). The wind and weather forecasts are for 24 hours and the flying weather forecast for 12 hours, those broadcast in the a.m. beginning with noon and those broadcast in the evening beginning at midnight

(4) The letter "X" will be substituted for any missing data

STATIONS :

U.S.A.							
DU	Duluth, Minn.	L	Alpena, Mich.	O	*Omaha, Nebr.	HN	*Huron, S. Dak.
M	Marquette, Mich.	D	†Detroit, Mich.	DM	Des Moines, Iowa	MH	‡Moorhead, Minn.
U	Sault Ste. Marie, Mich.	V	Cleveland, Ohio	DP	Davenport, Iowa		
G	†Green Bay, Wis.	ER	†Erie, Pa.	PO	†Peoria, Ill.		
MK	†Milwaukee, Wis.	F	Buffalo, N.Y.	SL	*St. Louis, Mo.		
CH	Chicago, Ill.	OS	†Oswego, N.Y.	IN	*Indianapolis, Ind.	PA	†Port Arthur, Ont.
GH	†Grand Haven, Mich.	SP	†St. Paul, Minn.	FA	†Fort Wayne, Ind.	PN	†Parry Sound, Ont.
		SP	†Minneapolis, Minn.	KC	*Kansas City, Mo.	SG	†Saugeen, Ont.

CANADA.

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
Pacific Coast					SYNOPTIC—MAJOR BULLETIN.
San Francisco (Naval Radio Station), NPG, 1,330 c.w. (for 0330 message) 4,650 c.w. (for 1700 message)	0330 (evening bulletin)	0100	S U.W. W. F.	American Code p.l.	"U.S.W.B." (United States Weather Bureau) In or InIn or InInIn BBBDF W'bwAC 3D ₁ V ₁ D ₂ V ₂ 4D ₃ V ₃ D ₄ V ₄ , etc. The second part of the bulletin consists of a synopsis of general atmospheric pressure d istribution, including the locations of High and Low areas, and the barometer readings at the centres ; wind and weather forecasts for pacifi offshore areas ; storm warnings for these areas and flying weather forecasts for each of the aviation zones (see map)
	1700 (morn- ing bulletin)	1300	S. W. F.	American p.l. p.l.	As 0330 message (above) As 0330 message (above) As 0330 message (above)

NOTES : (1) Alaskan reports included in the 0330 message are ob. taken at 1700 ; and those included in the 1700 morning message are ob. taken at 0500

(2) The Honolulu report included in the 0330 message is an ob. taken at 1830 and that included in the 1700 message one taken at 0630

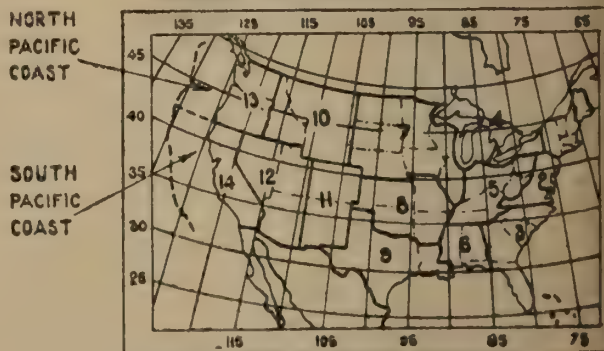
(3) Stations in capitals are those which are included regularly in the 0330 message and in the 1700 message when obtained in time. When upper air obs. are not possible because of dense fog, rain or snow, the word FOGGY, RAIN or SNOW, as the case may be, will be sent instead of the third group

(4) Barometric tendency reports are not received from all stations and no cloud reports from the Alaskan, Canadian, and some United States stations. The missing data in this group will be represented by the appropriate number of X's

(5) The second part of the bulletin is in plain language and consists of a synopsis of general pressure distribution ; wind and weather forecasts for ocean zones for a period of 24 hours beginning at noon day of issue ; storm warnings ; and flying weather forecasts by zones for a period noon to midnight of day of issue

(6) The letter "X" will be substituted for any missing data

AVIATION AND MARINE FORECAST ZONES



AVIATION FORECAST ZONES IN BLACK
MARINE FORECAST ZONES SHOWN DOTTED

S.A.—con'd.

ATIONS :							
ALASKA :	SE	SEATTLE, WASH	DI	SAN DIEGO, CALIF.	PH	Phoenix, Ariz.	
I Dutch Harbor	NH	North Head, Wash.	HL	Helena, Mont.	YU	Yuma, Ariz.	
Eagle	PD	Portland, Oreg.	BS	Boise, Idaho	HO	Honolulu, T.H.	
Juneau	RO	Roseburg, Oreg.	LD	Lander, Wyo.			
M Nome	EUR	Eureka, Calif.	WM	Winnemucca, Nev.			CANADA :
Sitka	RB	Red Bluff, Calif.	R	Reno, Nev.			
N Tanana	SM	SACRAMENTO, CALIF.	SLC	Salt Lake City, Utah	ED	Edmonton, Alberta	
	SF	SAN FRANCISCO, CALIF.	MD	Modena, Utah	KA	Kamloops, B.C.	
UNITED STATES :	FN	Fresno, Calif.	DV	Denver, Colo.	CY	Calgary, Alberta	
	SLO	San Luis Obispo, Calif.	GJ	Grand Junction, Colo.	SC	Swift Current, Sask.	
AT Tatoosh Is., Wash.	LA	LOS ANGELES, CALIF.	SA	Santa Fé, N. Mex.	PR	Prince Rupert, B.C.	

The names of the aerological stations are not included in the bulletin. Observations therefrom are made a part of the report of the nearest regular Weather Bureau station. The location of the aerological stations, the service at conducts them, and the surface stations with which the data are coded, are as follows :—

Aerological stations.	Conducted by	Surface stations, with which upper air reports are included.
North Island, Calif.	U.S. Navy	San Diego, Calif.
Ross Field, Calif.	Signal Corps, U.S.A.	Los Angeles, Calif.
San Francisco, Calif.	U.S. Weather Bureau	San Francisco, Calif.
Mather Field, Calif.	Signal Corps, U.S.A.	Sacramento, Calif.
Camp Lewis, Wash.	Signal Corps, U.S.A.	Seattle, Wash.

Country, Station, Call, Wavelength.	Time of transmission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
	0000	—	—	—	A report of the weather conditions in the Bonita Channel is furnished every four hours. The bulletin is sent <i>en clair</i>
	0400	—	—	—	
	0800	—	—	—	
	1200	—	—	—	
	1600	—	—	—	
	2000	—	—	—	LOCAL BULLETINS. F=Forecast for the coast of New Hampshire, Massachusetts and Rhode Is. S=Bar. pressure, wind direction and velocity and state of weather at Highland Light, Nantucket and Block Is. F=Forecast for the Coast of South Carolina S=Bar. pressure, direction and force of wind, and state of weather at Charleston F=Wind and weather forecasts and storm warnings for California coast north of San Francisco ; advices concerning storm warnings for north Pacific Coast S = Barometric pressure, wind direction and velocity and state of weather at Eureka at times given W = At 1700 : storm warnings for coast of California north of San Francisco, and advices concerning storm warnings for North Pacific coast NOTE : These messages are also issued on request F = Forecast for the coast of Texas from Port Arthur to Corpus Christi S = Bar. pressure, direction and force of wind, and state of weather at Galveston F = Wind and weather forecasts and storm warnings for California coast south of San Francisco ; advices concerning storm warnings issued for California coast S = Barometric pressure, wind direction and velocity and state of weather at San Pedro (1300 ob. only), San Francisco and San Diego (1300 and 0100 ob.) W=Storm warnings for the coast of California south of San Francisco and advices concerning storm warnings for the coast of California NOTE : Storm warnings are also sent on request
Boston (Mass.), NAD, 1,363	1600	1300	F.S.	—	
c.w.	2200	—	—	—	
Charleston, NAO, 2,600 sp.	1530	1300	F.S.	—	
Eureka (California), NPW, 2,250 sp.	0130	—	S.W.	—	
	2200	—	F.S.	—	
			W.	—	
Galveston, NKB, 1,817 sp. . .	1630	1300	F.S.	—	
	2300	—	S.	—	
Inglewood, NPX, 1,428 sp.	0430	0100	F.S.W.	—	
	1630	1300	F.S.W.	—	

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					
Jupiter, NAQ, 1,305 sp. ..	1630 2300	1300 —	F.S. —	— —	F = Forecast for the east coast of Florida from Miami to Key West S = Bar. pressure, direction and force of wind, and state of weather at Miami
New Orleans, NAT, 2,600 sp.	0300 1530	— —	— —	— —	At 0300 and 1530 a message containing summary of meteorological conditions of the United States at 0100 and 1300, respectively is broadcasted daily. It will include a forecast for Louisiana, Arkansas, Oklahoma, Eastern Texas (east of the 100th meridian) and Western Texas (west of the 100th meridian) winds off the Louisiana and Texas coast forecasts on the Ouachita and the lower Red and Mississippi rivers (these forecasts are sent at 1530 only)
	1600	—	—	—	The 1600 message contains a forecast for the coasts of Louisiana and Texas, from Bay St. Louis to Port Arthur; also, the 1300 observations for barometric pressure, direction and force of wind, and the state of the weather at Burrwood and Port Arthur
New York, NAH, 1,540 sp. ..	1530 2200	1300 —	F.S. —	— —	F = Forecasts for (1) the coasts of New York and Connecticut, and (2) from Sandy Hook to the Grand Banks for European steamers S = Ob. of bar. pressure, wind and state of weather at Sandy Hook
Norfolk, NAM, 1,360 sp. (507 sp. and c.w. for 0130 message)	0100 0130* 1330 1545 2100	0100 1300 — — —	S. S. F. — —	— — — — —	S = Bar. pressure, state of weather, direction and force of wind, condition of sea, and visibility at Cape Henry and Cape Hatteras F = Forecast for the coasts of Virginia and North Carolina
North Head, NPE, 2,700 sp.	0130 0430 0530 1330 1730 2130	— — — — — —	S.W. F.W. F. S. F.S.W. S.W.	— — — — — —	F = Wind and weather forecasts and storm warnings for Washington and Oregon Coast and mouth of Columbia River; advice concerning storm warnings issued for North Pacific Coast S = Current bar pressure, wind direction and velocity and state of weather at North Head W = Storm warnings for the coasts of Washington and Oregon and Columbia River entrance, followed by advices concerning storm warnings issued for the North Pacific Coast NOTE: These reports are also issued on request
Pensacola, NAS, 1,330 c.w. ..	1645 2300	1300 —	F.S. —	— —	F = Forecast for the Coasts of Florida and Alabama from Apalachicola to Bay St. Louis S = Current bar. pressure, direction and force of wind and state of weather at Pensacola
Philadelphia, NAI, 1,330 c.w.	1545 2200	1300 —	F.S. —	— —	F = Forecast for the coasts of New Jersey, Delaware and Maryland S = 1300 ob. of wind and state of weather at Delaware breakwater
Portland, NAB, 800 sp. ..	0100 1700	— 1300	— F.S.	— —	F = Forecast for the coast of Maine from Eastport to Portsmouth S = Bar. pressure, direction and wind force and state of weather at Portland
San Juan, NAU, 4,850 c.w.	0200	—	—	—	
Savannah, NEV, 1,806 sp. ..	1100 2300	1300 —	F.S. —	— —	F = Forecast for the coast of Georgia S = Bar. pressure, direction and force of wind and state of weather at Savannah
St. Augustine, NAP, 2,100 sp.	0000 1630	— 1300	— F.S.	— —	F = Forecast for the east coast of Florida from Jacksonville to Miami S = Bar. pressure, direction and force of wind, and state of weather at Jacksonville and Titusville

Country, Station, Call, Wavelength.	Time of trans- mission G.M.T.	Time of ob. G.M.T.	Nature of Report.	Code.	Form of Message and Notes.
(1)	(2)	(3)	(4)	(5)	(6)
U.S.A.—contd.					
Swiftsure Bank Light-vessel, NABT, 600 and 952 sp.	0000 0400 1600 2000	— — — —	— — — —	— — — —	
Tatoosh, NPD, 1,654 sp.	0100 0400 1300 1700 2100	— — — — —	S.W. F.S.W. S. F.S.W. S.W.	— — — — —	F = Wind and weather forecasts and storm warnings for Washington coast and Puget Sound; advices concerning storm warnings issued for North Pacific coast. S = Current barometric pressure, wind direction and velocity, and state of weather at Tatoosh Island. Reports of fog in Strait of Juan de Fuca. W = Storm warnings for coast of Washington and Puget Sound, followed by advices concerning storm warnings for the North Pacific coast. NOTE: These reports are also sent on request
Umatilla Reef Light-vessel, NACV, 600 and 952 sp.	0000 0400 1600 2000	— — — —	— — — —	— — — —	Local weather reports only
Atlantic Coast					
Annapolis, NSS, 17,145 c.w.	—	—	—	—	
	0530	0100 (See notes)	S. O.	N.I.C. (mod.) "	"Angot Paris" In (or InIn or InInIn) BBBDF (Ship Call Signal) PQ'LLL IIGG BBBDF TTC. Followed by centres of predominating high and low pressure areas thus (name of station) BBBDF (See under France-Eiffel Tower International Collective Reports.)
VIRGIN ISLANDS.					
St. Croix, NNI, 450	—	—	W.	p.l.	Hurricane warning are transmitted when issued by the San Juan weather Bureau and repeated every 4 hours.
St. Thomas, NBB, 1,685	—	—	W.	p.l.	
WINDWARD PASSAGE					
Navassa, NKC, 600 sp.	request	—	—	p.l.	Barometer readings corrected to sea level

(2)—TIME SIGNALS

CHART A.

ORDINARY TIME SIGNALS (OLD SYSTEM, SEMI-AUTOMATIC)

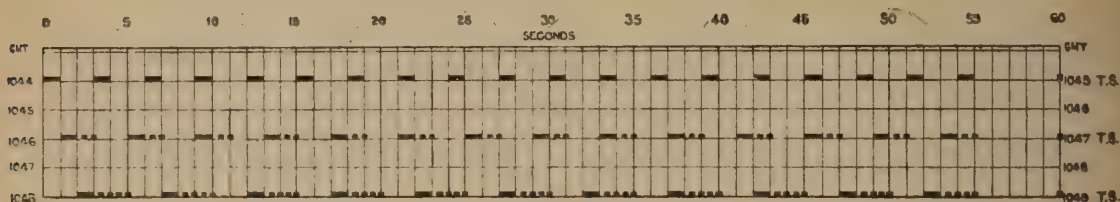
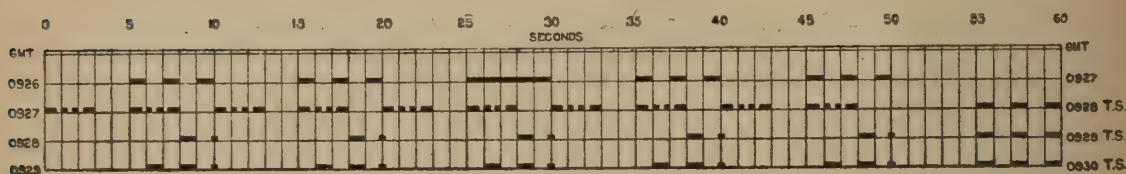


CHART B.

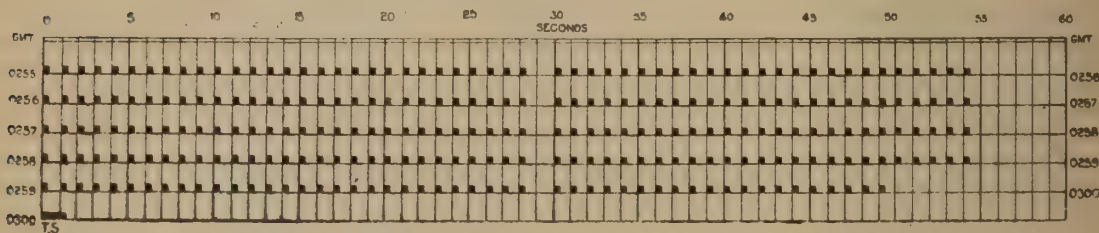
NEW INTERNATIONAL CODE (AUTOMATIC)



NOTE : The second line of the New International Code (above) has now been altered so that the commencement of each dot and dash comes at the even second ; the signal — • • — has therefore been somewhat extended and now takes a time interval of nearly 4 seconds.

CHART C.

AMERICAN SYSTEM



These dots are of duration 0.3 sec.

FRENCH RHYTHMIC SIGNALS.

(1) These signals are intended for accurate geodesical work in determining the difference of longitude and for rating chronometers. They are transmitted direct from the standard astronomical clock in sidereal time units. It is interesting to note that the Bordeaux Rhythmic Signals are received regularly at the Hector Observatory, Wellington, New Zealand.

(2) French stations sending scientific or vernier time signals (signaux rythmés) : Eiffel Tower, Bordeaux and Lyons (for times see Tables).

(3) PROCEDURE :

The signals will consist of the transmission of 300 dots (representing the beats of a clock) except that Nos. 60 and 61, 120 and 121, 180 and 181, and 240 and 241 are omitted, being replaced by a dash of nearly one second's duration, or the equivalent of two beats (or dots). The interval between

successive dots represents one beat of the clock adjusted to beat 50 times in 49 seconds (Greenwich Sidereal Time). Each series is sent by the following method :—

G.M.T. (approx.).		Procedure
From	To	
h. m. s.	h. m. s.	
9 57 00		A series of trial or regulation dots • • • • • • • • • • etc., for nearly one minute.
9 59 00	9 59 50	— • — • — • — • — • — — • — • — • — • — • — (call signal). Break sign.
10 00 00	10 05 00	Beats Nos. 1, 2, 3, etc., to 59. Dash (—) of one second's duration, nearly, equal to the interval of two consecutive beats, its commencement coinciding with the beginning of No. 60 and the finish with the end of No. 61. Beats Nos. 62, 63, 64, etc., to 119. Dash (—) of one second's duration nearly, as before, its commencement coinciding with the be- ginning of No. 120 and the finish with the end of No. 121. Beats Nos. 122, 123, etc., to 179, and so on until No. 300 (Nos. 180 and 181, and 240 and 241 being given as a dash). The interval between each dot (or beat) = 49/50 sec. Sidereal Time (which is equal to 44/45 sec. Mean Time, nearly).

(NOTE.—This system came into force on October 15th, 1923, and replaces the old system of *suppressing* dots 60, 120, 180 and 240 for identification purposes.)

(4) CORRECTIONS.—The corrected times of transmitting the *first* and *last* dots are sent later the same day (see Tables for times) as follows :—

Two groups of eight figures each, sent three times in succession, and separated by the "break signal," *e.g.* :

" Temps sidéral " — • • • • — 10305622, 10354940 — • • • • —
10305622, 10354940 — • • • • — 10305622, 10354940.

It should be noted that the hour is omitted from the times sent, and that all units are expressed in sidereal time. Thus :

	h.	m.	s.
Signalled time of last dot	= 10	35	49.40
Signalled time of first dot	= 10	30	56.22
Time of whole series	= —	4	53.18
	=	293.18	sec. (sidereal)

∴ Average interval between two dots = $\frac{293.18}{299} = .9805$ sec. (sidereal).

These times can be converted to Greenwich *Mean* Time (if required) by making use of tables given in the "Nautical Almanack."

B—TIME SIGNALS TRANSMITTED FROM VARIOUS COUNTRIES

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
ARGENTINE				
Buenos Aires— (Darsena Norte)— Lat. 34° 35' 40" S. Long. 58° 22' 07" W.	LIH	1,000 sp.	<div>h. m. s. h. m. s.</div> <div>01 55 00-01 55 50</div> <div>01 56 00</div> <div>01 56 15 01 56 50</div> <div>01 57 00</div> <div>01 57 20 01 57 50</div> <div>01 58 00</div> <div>01 58 25 01 58 50</div> <div>01 59 00</div> <div>01 59 30 01 59 50</div> <div>02 00 00</div>	<div>----- etc.</div> <div>• (T.S.)</div> <div>----- etc.</div> <div>• (T.S.)</div> <div>----- etc.</div> <div>• (T.S.)</div> <div>----- etc.</div> <div>• (T.S.)</div> <div>----- etc.</div> <div>• (T.S.)</div>
<div>NOTE: (1) Daily, except Sunday and holidays.</div> <div>(2) Controlled by Naval Office at Darsena Norte</div> <div>(3) Duration of dot = 1 sec.</div>				
AUSTRALIAN COMMONWEALTH				
Adelaide— Lat. 34° 52' 00" S. Long. 138° 31' 00" E.	VIA	600 sp.	0227-0230 1427-1430	New International New International (Controlled by Adelaide Ob.)
Melbourne— Lat. 37° 50' 05" S. Long. 144° 58' 46" E.	VIM	600 sp.	0157-0200 1357-1400	New International New International (Sun. excepted)
Perth— Lat. 32° 01' 50" S. Long. 115° 49' 49" E.	VIP	600 sp.	1057-1100 2257-2300	New International New International (Controlled by Perth Ob.)
Sydney—	VIS	600 sp.	1057-1100 0257-0300	(Automatic transmission from Sydney Ob.) Dashes at 05-25, 105-115, 205-215, 305-315, 405-415, 505-515 in each minute, and a dot at every other second.
BRAZIL				
Rio de Janeiro (Ilha de Governador) Lat. 22° 48' 00" S. Long. 43° 13' 00" W.	SOH	1,800 sp.	1357-1400 2357-2400	New International New International NOTE.—Signals sent 30 minutes later in case of accident preventing transmission at correct times.
BRITISH INDIA				
Calcutta— Lat. 22° 33' 34" N. Long. 88° 20' 14" W.	VWC	2,000	0127-0130 1327-1330	New International New International NOTES: (1) Preliminary signals sent two minutes before transmission T.S. proper, call—••••• repeated three times "ordinary time signals," "wait" (•—••••); these signals are sent by hand. (2) Signals automatically controlled from Alipore Ob., Calcutta. (3) T.S. accurate to within 0.2 sec. (4) Should there be any inaccuracy, the T.S. is followed by the "error" signal and the word "signal failed."
CANADA				
Camperdown (Halifax)— Lat. 44° 31' 10" N. Long. 63° 32' 40" W.	VCS	600 sp.	<div>h. m. s. h. m. s.</div> <div>13 58 00-13 58 57</div> <div>13 59 00</div> <div>13 59 03-13 59 50</div> <div>14 00 00</div>	<div>A dot at each second</div> <div>• (T.S.)</div> <div>A dot at each second</div> <div>• (T.S.)</div> <div>Daily except Sun.</div>

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
ERITREA				
Massawa	ICX	3,500 sp.	5 00 00 5 02 00 5 04 00	A series of — — — — • (T.S.) followed by a series — — — — — • (T.S.) followed by a series — — — — — • (T.S.) NOTE.—The duration of each dash is 5 sec.
FRANCE				
Eiffel Tower— Lat. 48° 51' 30" N. Long. 0° 19' 11" E.	FL	2,600 sp.	From To 0927-0930 0958-1005 1038-1043 1044-1049 2158-2205 2238-2243 2244-2249 0800-0805 0850-0854 0855-0904 2000-2005 2115-2120	New International (automatic) Rhythmic beats (automatic) Groups for correcting Rhythmic beats Old French System (semi-automatic) Rhythmic beats (automatic) Groups for correcting Rhythmic beats Old French System (semi-automatic) Rhythmic beats (automatic) Groups for correcting Rhythmic beats Old French System (semi-automatic) Rhythmic beats (automatic) Groups for correcting Rhythmic beats
Lyons— Lat. 45° 41' 00" N. Long. 0° 19' 08" E.	YN	15,500 c.w.		
Bordeaux— Lat. 44° 42' 00" N. Long. 0° 48' 00" W.	LY	18,940 c.w.		
FRENCH INDO CHINA				
Kien-Au— Lat. 20° 47' 00" N. Long. 106° 37' 00" E.	FKA	600	02 15 00 02 17 00 02 19 00	— — — — — — • • — • • • •
GERMANY				
Nauen— Lat. 52° 39' N. Long. 0h. 50m. 20s. W	POZ	1,300 c.w. 3,100 (undamped musical)	1157-1200 2357-2400	New International NOTES: (1) In the event of an inaccuracy in these signals the "erase" signal of 8 dots, repeated twice, will be sent immediately after the message. (2) Preparatory signal POZ (station call), a MGZ (meaning G.M.T.)
GREECE				
Athens— Lat. 37° 58' 30" N. Long. 23° 43' 13" E.	SXA	1,200 sp.	21 55 00- 21 57 00-21 57 50 21 57 55-21 58 00 21 58 08-21 58 50 21 58 55-21 59 00 21 59 08-21 59 50 21 59 55-22 00 00	Provisional Daily Time Service CQ Time Signal QRX — • • • — • • — etc 55 56 57 58 59 00 08 09 10 every 20 secs. 55 56 57 58 59 00 06 07 08 09 10 every 20 secs. 55 56 57 58 59 00 Time Signal
HAWAIIAN ISLANDS				
Pear Harbour (Honolulu) Lat. 21° 18' 23" N. Long. 157° 51' 56" W.	NPM	2,250 sp. 11,500 c.w.	2355-2400	American Code. Accurate to 0.2 s with San Francisco Naval Ob. Time

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
HONG KONG				
Recutters— Lat. 22° 19' 21" N. Long. 114° 8' 43" E.	BXY	2,000	0156-0200 1256-1300	Preliminary signals sent 2 mins. before transmission of T.S. proper CQ de BXY "Time wait." The T.S. are dots 0.2 sec. duration) sent at the even seconds from 0156-0200 G.M.T. and from 1256-1300 G.M.T. The dots are omitted at the 2nd, 28th, 50th, 52nd and 54th sec. of each minute for the purpose of identifying the signals. NOTE.—Controlled from Hong Kong Ob.
ITALIAN SOMALILAND				
Mogadishu	ISG	2,850	03 52 00- 3 53 48 03 54 00- 3 54 38 03 55 00- 3 55 51 03 56 00 03 57 00- 3 57 52 03 58 00 03 59 00- 3 59 53 04 00 00	ISG ISG ISG etc. "Segnale orario" followed by — • — • — sent four times — sent every 5 secs. • (T.S.) — • • sent every 5 secs. • (T.S.) — • • • sent every 5 secs. • (T.S.) All preliminary signals are made by hand. The T.S. proper, are of 0.20 sec. duration, and are transmitted automatically by a pendulum
ITALY				
Asmara	IRG	4 000	0500	
Gadiscio	ISE	4,000	0400	
JAPAN				
Yokohama— Lat. 35° 42' 00" N. Long. 139° 59' 00" E.	JJC	4,000 c.w.	11 59 00-11 59 55 12 00 00-12 00 01 12 00 30-12 00 55 12 01 00-12 01 01 12 01 30-12 01 55 12 02 00-12 02 01 12 02 30-12 02 55 12 03 00-12 03 01 12 03 30-12 03 55 12 04 00-12 04 01	— — — — — etc. — (T.S.) — • — • — • — • — etc. — (T.S.) — • • — • • — • • etc. — (T.S.) — • • — • • — • • etc. — (T.S.) — • • — • • — • • etc. — (T.S.) — • • — • • — • • etc. — (T.S.)
Osaka— Lat. 35° 44' 8" N. Long. 140° 51' 12" E.	JCS	600 sp		
SEYDLAND				
Seydl	BZG	2,000	0859-0901 2059-2101	"N's" made by hand every 10 secs. from 0859 to 0900; "G's" made by hand every 10 secs. commencing at 10 secs. past 0900, and concluding with dash at 0901 operated from Ob. NOTES: (1) The beginning of the dash at each minute is the T.S. (2) T.S. controlled from Tokyo Ob. (3) Daily except Sundays
SOMALILAND				
Asmara	VTC	600 sp.	10 57 42 10 58 42-10 59 42 10 59 57-11 00 00	CQ de VTC (sent twice). Time signal 1100 G.M.T. (sent twice) — • • — • • — etc. — (of 3 secs. duration). (End of dash is T.S.)

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
MEXICO				
Chapultepec (Mexico City)— Lat. 19° 25' N. Long. 99° 11' W.	XDA	1,200 5,800	06 56 10-06 56 27 06 56 30-06 56 49 06 57 00-06 59 50 07 00 00-07 00 02 12 54 10-12 54 27 12 54 30-12 54 49 12 55 00-12 59 50 13 00 00-13 00 02	"XDA" (three times) "QSD" (three times) A dot at every second, except the dots 29, 55, 56, 57, 58 and 59 of each minute are suppressed (as in American system) A two seconds dash "XDA" "QSD" A dot at every second, except the dots 29, 55, 56, 57, 58 and 59 of each minute are suppressed (as in American Code) A two second's dash
NEW ZEALAND				
Wellington— Lat. 41° 17' 04" S. Long. 174° 46' 04" E.	VLW	600 sp.	22 58 00-22 59 05 22 59 10-22 59 50 23 00 00-23 00 01 23 00 12-23 00 50 23 01 00-23 01 01 23 01 13-23 01 50 23 02 00-23 02 01 23 02 14-23 03 50 23 04 00-23 04 01 23 04 09-23 04 50 23 05 00-23 05 01	(1) DAYLIGHT TIME SIGNALS. "New Zealand Ob. time signals twenty-three hours G.M.T." (repeated) --- • --- • --- • etc. (Hand signals) --- (T.S.) --- etc. (Hand signals) --- (T.S.) --- etc. (Hand signals) nals) --- (T.S.) --- etc. (Hand signals) etc. (Hand signals) --- (T.S.) --- etc. (Hand signals) --- (T.S.) --- etc. (Hand signals) --- (T.S.) NOTES: (1) "Time" in preliminary calling up signal is G.M.T. Astronomical (i.e., reckoned from noon). (2) The Daylight Time Signals are sent every day except Saturdays, New Zealand date (= Sunday), New Zealand Government holidays. (3) Each signal commences exactly at the beginning of the minute and lasts for one second approximately. There is no T.S. 23h. 03m. 00s.
Wellington—(continued)—	VLW	600 sp.	0900-0905	(2) NIGHT TIME SIGNALS. Exactly as for Daylight Signals (above) NOTES: (1) These T.S. are transmitted on Mondays, Thursdays, Greenwiche date (= Tuesday), Friday evenings, New Zealand date), except New Zealand Government holidays. (2) The first T.S. is 09h. 00m. 00s. (G.M.T.) and is repeated at 1st, 2nd, 4th, and minutes. There is T.S. at 09h. 03m. 00s. (3) N.Z.M.T. is 11½ ahead of G.M.T. (4) The signals, other than the actual T.S. transmitted by hand

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
NAMA				
on— lat. 9° 21' 56" N. long. 79° 54' 01" W.	NAX	1,620 sp.	0955-1000 1755-1800	American Code American Code. Daily. Maximum error not more than 0.5 sec., usual error not more than 0.1 sec.
boa— lat. 8° 56' 34" N. long. 79° 33' 20" W.	NBA	7,000 c.w.	0955-1000 1755-1800	American Code. Daily.
ILIPPINE ISLANDS				
ite— lat. 14° 29' 1" N. long. 120° 54' 43" E.	NPO	952 sp. 5,000 c.w. (together)	0255-0300 1355-1400	American. American. NOTE.—Signals controlled from Manilla Ob. by land line Daily. Sundays and holidays included.
RTUGUESE EAST AFRICA				
urenço Marques— lat. 25° 58' 5" S. long. 32° 35' 39" W.	CRZ	600 sp.	0757-0800 1857-1900	New International New International NOTES: (1) Signals controlled by Campos Rodrigues Ob. (2) Measured lag of 0.02 sec. allowed for in transmission.
USSIA				
trograd— lat. 59° 46' 19" N. long. 30° 19' 39" E.	RAC	1,500 sp.	<div>h. m. s. h. m. s.</div> <div>19 00 00-19 02 00</div> <div>19 02 20-19 02 50</div> <div>19 03 00-19 03 05</div> <div>19 03 20-19 03 50</div> <div>19 04 00-19 04 05</div> <div>19 04 20-19 04 50</div> <div>19 05 00-19 05 05</div> <div>19 05 10 19 05 35</div>	<div>(1) ORDINARY TIME SIGNALS.</div> <div>• — • — • — • — • — (RAC)</div> <div>— — — — — etc.</div> <div>T.S. consisting of 3 dashes each of 1 sec. duration with 1 sec. space</div> <div>— — — — — etc.</div> <div>T.S. (as above)</div> <div>— — — — — etc.</div> <div>T.S. (as above)</div> <div>The corrected time is then made in a group of 3 figures (Morse) sent 4 times</div> <div>Connected with Pulkova Ob. by land-line</div> <div>NOTES.—The commencement of the dash is the time signal</div> <div>The first signal of the third series, transmitted exactly at 19h. 05m. 00s. G.M.T., will be considered to be the <i>basic</i> (standard) signal. Only the error of the basic signal will be transmitted from 19h. 05m. 10s. to 19h. 05m. 35s. If the correct time at the moment of transmission is 19h. 05m. 00.2s. (<i>i.e.</i>, if the standard clock is 00.2s. sec. slow) there will be transmitted the figures 002 sent four times. If, on the other hand, the standard clock is 00.6 sec. fast, making the exact time 19h. 04m. 59.4s. the error will be represented by the figures 594 sent four times.</div> <div>(2) RHYTHMIC SIGNALS.</div> <div>Preparative (or warning) signals consisting of a number of dots.</div> <div>Two series of signals of 26 beats (or dots) with an interval of 0.96 sec. between each beat are transmitted from 0.25 sec. and from 30.35 sec. of each minute. The total number of series is 16 with an interval of 4.8 secs. between each</div> <div>Final signal EC (• — • — • — • —)</div>
			<div>19 05 40-19 05 50</div> <div>19 06 00-19 13 55</div>	

Country and Station.	Call.	Wavelength.	G.M.T. Times.	System.
RUSSIA—contd.				
Moscow— Lat. 55° 46' 19" N. Long. 30° 19' 39" E.	RAI	5,000 sp.	h. m. s. h. m. s. 21 55 00-21 57 00 21 57 20-21 57 50 21 58 00-21 58 05 21 58 20-21 58 50 21 59 00-21 59 05 21 59 20-21 59 50 22 00 00-22 00 05 22 00 20-22 01 20	(1) ORDINARY TIME SIGNAL • • • • • (RAI) — — — — — etc. (T.S) as for Petrograd ordinary T — — — — — etc. T.S. (as above) — — — — — etc. T.S. (as above) The corrected time is made in the figures and sent four times Connected with the Pulkova Ob. land-line See Notes for Petrograd (above)
			22 02 00-22 02 15 22 02 30-22 12 19	(2) RHYTHMIC SIGNALS Preparative (or warning) signal consisting of a succession of dots The signal will consist of dots with intervals of about 1 sec. In all, series are transmitted, divided into two groups of short series (6 to each group), separated by one long series. The duration of the short series is 30 secs. each and of the long series is mins. There are intervals of 10 secs. between the separate series. Final signal EC (• — — — •) — • • • • (attention) • • • • • (RQA) • • • • • — every 5 secs. — — — — — one long 5 sec. dash (T) — — — — — every 5 secs. — — — — — one long 5 sec. dash (T) — — — — — every 5 secs. — — — — — one long 5 sec. dash (T)
Archangel— Lat. 64° 27' 00" N. Long. 40° 39' 00" E.	RQA	600 sp.	00 52 00-00 55 45 00 56 00-00 57 00 00 57 10-00 57 45 00 57 55-00 58 00 00 58 10-00 58 45 00 58 55-00 59 00 00 59 10-00 59 45 00 59 55-01 00 00	Time signals are sent daily for the benefit of Russian Northern Wireless stations. As the signals are made by hand, errors up to 5 secs. may result. The end of the long dash is the T.S.
SARAWAK				
Kuching— Lat. 1° 13' 19" N. Long. 110° 10' 50" W.	VQF	600 sp.	0039	The signal is given at 8h. oom. Local Time.
SOUTH AFRICA				
Capetown— Lat. 34° 8' 46" S.	VNC	600 sp.	20 59 30-21 00 00	Warning Signal commences at 21 00 00 A series of 12 dashes, each of about 3 sec. duration, extending over half a minute and divided up into four groups; a dash commencing at each of the following times:— h. m. s. h. m. s. 20 59 30 Group I 20 59 48 Group IV 32 I 50 IV 34 20 59 38 Group II 20 59 54 Group V 40 II 56 V 58 20 59 44 Group III 21 00 00 III
NOTE.—Each signal may be used as indicating the exact G.M.T. required above; the beginning of the last of the series is exactly 21h. 00m. G.M.T. Signals sent daily, continuing from Ob				

Country and Station.	Call.	Wavelength	G.M.T. Times.	System.
3.A.				
Annapolis— Lat. 38° 59' 00" N. Long. 76° 27' 00" W.	NSS	17,145 c.w.	0255-0300 1655-1700	All American Time Signals are sent according to the American Code. Signals sent daily: The "lag" of the Annapolis T.S. is 0.08 sec. (constant)
Great Lakes— Lat. 42° 18' 30" N. Long. 87° 50' 00" W.	NAJ	1,988 sp.	1655-1700	Daily, except Sundays and Holidays. Controlled by Naval Ob., Washington
San Diego— Lat. 32° 42' 26" N. Long. 117° 14' 49" W.	NPL	1,988 sp. 9,800 c.w.	1955-2000	Daily. Controlled by Naval Ob. Mare Island
San Francisco— Lat. 37° 39' 18" N. Long. 122° 22' 52" W.	NPG	4,650 c.w. 1908 sp.	1655-1700 0325-0330	do. do. do
North Head— Lat. 46° 17' 56" N. Long. 124° 04' 31" W.	NPE	2,700 sp.	0425-0430 2125-2130	Daily, except Sundays and holidays Controlled by Naval Ob., Washington
San Francisco— Lat. 40° 41' 22" N. Long. 124° 16' 10" W.	NPW	2,650 sp.	1955-2000	do do do
San Francisco— Lat. 47° 38' N. Long. 122° 20' W.	NVL	1,988 sp.	2055-2100 0155-0200	—
Washington (Arlington)— Lat. 38° 52' 05" N. Long. 77° 44' 47" W.	NAA	2,650 sp.	0255-0300 1655-1700	Daily. Controlled by Naval Ob. Washington The "lag" of the Arlington T.S. is 0.09 sec. (constant). Error generally less than 0.1 sec.
Key West— Lat. 24° 33' 28" N. Long. 81° 48' 26" W.	NAR	1,988 sp.	0255-0300 1655-1700	Daily, except Sundays and holidays Controlled by Naval Ob., Washington The "lag" of the Key West T.S. is 0.28 sec
New Orleans— Lat. 29° 56' 50" N. Long. 90° 02' 18" W.	NAT	1,832 sp.	1655-1700	Daily
Charleston (S.C.)	NAO	2,250 sp.	1655-1700	These stations transmit only when Washington NAA is out of action.
Norfolk (Va.)	NAM	1,851 sp.		
New York	NAH	1,832 sp.		Daily. (Sundays and Holidays excepted)
Newport (R.I.)	NAF	1 908 sp.		
Boston (Mass.)	NAD	1,620 sp.		

(3)—HYDROGRAPHIC SECTION.

Regulations for the Safety of Navigation.

SAFETY SIGNAL.—The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstruction or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power : — — — (T T T). In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress. The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes. The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character. When the information in question has been sent out by stations performing the time service it shall be again sent out after the transmission of the time signal and the weather report.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
ALASKA Dutch Harbour, NPR, 2,250 sp.	0530* 0930*	—	Naval W/T stations will furnish this information to passing vessels whenever practicable, <i>on request</i> .
ALGERIA Oran, FUK, 600 sp. 1,350 .. Fort de l'Eau, FFA, 600 sp. ..	1800 request request	Western Mediterranean .. —	The warning will be repeated daily for a week if necessary
ARABIA Aden, BZF, 600 sp.	0130 1330*	—	<i>En clair</i> message (English)
AUSTRALIAN COMMON-WEALTH			

NAVIGATION (DANGER CALLS) REGULATIONS, 1921.

1. These Regulations may be cited as the Navigation (Danger Calls) Regulations, 1921
2. The master of a ship registered in Australia or of a ship (whether British or foreign) engaged in the coasting trade, who is informed of (otherwise than by wireless message sent out in conformity with these Regulations), or who meets with, any dangerous ice, dangerous derelict, or other imminent and serious danger to navigation on or near his course (including any development of a cyclonic disturbance or typhoon, sudden and serious changes in position or form of, or the disappearance of, any fixed obstruction, light-buoy or beacon, and the extinguishing or serious impairment of the light of any ocean lighthouse or lightship) shall—
 - (a) If the ship is fitted with wireless, immediately send out the danger call specified in Schedule IV to the *Navigation Act, 1912-1920*, followed, as provided in that Schedule, by a message conveying the information required to be communicated under these Regulations; or
 - (b) If the ship is not fitted with wireless, at the earliest opportunity communicate, by international Code Signals, if during daylight, or by Morse Code, if at night, the information to other ships in the vicinity or which he meets and to the first signal station on shore to which he approaches within signalling distance, and through that signal station make a report to the Director of Navigation communicating the information.
3. The master shall enter in the official log book a record of—
 - (a) All new dangers to navigation observed;

- (b) All messages or information received in regard to other new dangers; and
- (c) All messages and reports sent in regard to such dangers, with, in each case, the hour and minute and the position of the ship at the time.
4. (1) The information required to be communicated under these Regulations shall include—
 - (a) In the case of dangerous ice, dangerous derelict, or other obstruction constituting an imminent and serious danger to navigation—
 - (i) Information as to the kind of ice, or nature of the derelict or other danger observed or informed of;
 - (ii) Information as to the position of the ice, derelict or other obstruction when last determined; and
 - (iii) If the danger reported is afloat and likely to change position, information as to the direction and force of the wind and the set and velocity of the current; and
 - (b) In the case of cyclonic disturbances or typhoons, information as to the direction and force of the wind and the bearing of the storm centre.
- 2) In all cases the message shall conclude with the name of the master and the call signal of the ship.
5. The officer in charge of a Commonwealth wireless station, or of a signal station, shall, on receiving any report sent in accordance with these Regulations, immediately transmit the information, by telephone if practicable or, if not, by urgent telegram, to the Deputy Director of Navigation for the State or other official designated by the Director of Navigation as the person to whom the messages should be transmitted.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
AUSTRALIAN COMMON-WEALTH — <i>contd.</i>			
Perth, VIP	1300*	Western Australian waters ..	
Brisbane, VIB	1200*	Queensland waters	
Sydney, VIS	1030*	East Coast	
	2230*		
Melbourne, VIM	1100*	Victorian and Tasmanian waters ..	
Adelaide, VIA	1130*	South Australian waters ..	
Broome, VIO	request	} Local	
Darwin, VID	request		
Thursday Is., VII	request		
Townsville, VIT	request		
Hobart (Tasmania), VIH ..	request		
All 600 sp.			
BELGIUM			
Ostende, OST, 600	0800	— —	Warnings are repeated 3 times at intervals of 10 minutes, in French and English
Antwerp, OSA, 600	0700		
	1500*		
West Hinder Light-vessel, OTW, 600 sp.	—	— —	Hours of service : From 0400 to 0420, and the first 20 minutes of each hour from 0800 to 2020
BERMUDA ISLAND			
Bermuda Dock Yard, BZB, 1,600 for (a), 600 for (b)	(a) 0015 1215 (b) 0020 1220	— —	
BRITISH INDIA			
Karachi, VWK	0115	— —	The warnings are broadcast as soon as possible after receipt, and then at times stated for five successive days, and will be continued if necessary
Bombay, VWB	1315 0105		
Madras, VWM	1305 0110		<i>En clair</i> messages (English)
Calcutta, VWC	1310 0115		
Rangoon (Burma), VTR ..	1315 0105		
Port Blair (Andaman Island), VTP	1305 0115		
(all above 600 sp.)	1315		
CANADA			
Nova Scotia			
Cape Sable, VCU	0200* 1400*	(1) Bay of Fundy (2) Nova Scotia and Newfoundland coasts (3) North Atlantic	Ice reports and navigational warnings
Lurcher Lt. V., VDR	request	— —	This station keeps watch for first half of every odd hour from 1100 to 2300, and from 0200 to 0230, G.M.T. Ice reports and navigational warnings
Camperdown, VCS	request	— —	
North Sydney, VCO	request	— —	
Sable Island, VCT	request	— —	
Canada			
Grindstone Is., VCN	request	— —	This station is open during season of navigation only, and keeps watch for the first half of every odd hour from 1100 to 2300, and from 0200 to 0230, G.M.T.
Heath Point Lt. V. (Anticosti Is.), VCI	request	— —	
Clarke City, VCK	request	— —	Open during the season of navigation only
Grosse Is., VCD	request	— —	Open during the season of navigation only
Montreal, VCA	request	— —	
St. John (New Brunswick), VAR	request	— —	

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
CANADA — <i>cont'd.</i>			
Fame Point (Quebec), VCG ..	0145* 1345*	Gulf of St. Lawrence and Straits of Belle Isle	Ice reports and navigation warnings. Also transmitted on request. Open during season of navigation only
Father Point (Quebec), VCF ..	0200 1400	River St. Lawrence and Gulf of St. Lawrence	do. do. do.
Quebec, VCC (all 600 sp.)	0130 1330	River St. Lawrence	do. do. do.
Great Lakes			
Kingston (Ontario), VBH ..	0400*	Lake Ontario	Navigational Warnings. Also sent on request
Toronto (Ontario), VBG ..	0340*	Lake Ontario	do. do. do.
Port Burwell (Ontario), VBF	0400*	Lake Erie	do. do. do.
Point Edward (Ontario), VBE	0410*	Lake Huron	do. do. do.
Midland (Ontario), VBC ..	0400*	Georgian Bay and Lake Huron	do. do. do.
Saulte Ste. Marie (Ontario), VBB	0420*	Lake Superior and Lake Huron	do. do. do.
Port Arthur (Ontario) VBA ..	0430*	Lake Superior	do. do. do.
Trberimory, VBD (all 600 sp.)	request		NOTE.—The above eight stations are only open during season of navigation.
CEYLON			
Colombo, VPB, 600	as neces- sary	---	---
Matara, BZE, 600	0135 1335*		<i>En clair</i> message (English); for further details see under British India
CHILE			
Valparaiso, CCE, 1,000 sp. ..	0100*	---	Messages are preceded by the letter OHIC (Oficina Hidrográfica de Chile)
DANZIG FREE STATE			
Danzig, KAZ, 600	—	---	International Ice report.
DENMARK			
Blaavand, OXB, 600 sp. ..	1120 2120	Ice conditions in the main Dan- ish waterways compiled from information received by the Meteorological Institute	Messages <i>en clair</i> (in English) — • • • — OXB OXB OXB. Ice report. This is followed by the number of words comprising the message proper and then the text of the latter, con- cluding with — • • • — The text only is repeated, and the message ends with: OXB OXB OXB. • • • — Example: — • • • — OXB OXB OXB Ice report 26 w. Kattegat west channel: closed for sailing vessels; Kattegat east channel packed ice; steamers beset; Kattegat southern part: open ice. Sound and Belts: drift ice; along west coast, packed ice. All lightships removed — • • • — (Repetition of foregoing) OXB OXB OXB • • • —
Copenhagen, OXA, 600 sp. ..	1100 2100	do. do. do.	As for Blaavand (above). Except for call sign.
ESTHONIA			
Tallinn, AZA, 1,900	0740	1st Group 1. Zerel 2. Filsand 3. Dagerort 2nd Group 4. Kynö 5. Werder 6. Worms 3rd Group 7. Pakerort 8. Reval 9. Stenskar	Only transmitted during winter. Same codes as for German. Ice reports (see Königswusterhausen)

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
INLAND			
Helsingfors, OJA, 1,500 sp. . .	1458*		Ice conditions as ob. on the morning of issue
		Fairway Viborg—Trangsund	AA IN IN IN IN IN IN
		Fairway Trangsund—Rödhäll	BB IN IN IN IN IN IN
		Off Rödhäll	CC IN IN IN IN IN IN
		Fairway Kotka—Rankö	etc.
		Off Rankö	The double letters AA, BB, etc.
		Off Luppi	divide the message into 6 main groups,
		Helsingfors S. Harbour and	each one consisting of two sub-groups
		neighbourhood	with three pairs of the letters IN in
		Off Sveaborg	each. The letters IN indicate the
		Off Gräskärsbadanna	conditions in a distinct area or fairway.
		At Porkkala	These areas are given in order in the
		Off Kallbaden	previous column
		The sea off Jussarö	
		Hango Harbour and neigh-	I = Ice Conditions
		bourhood	0 Clear of ice
		At Russarö	1 Light ice
		The outer sea off Russarö	2 Close sludge
		Hangö western Fjärd	3 Fixed sheet of ice
		Abö Harbour to Stora Bocken	4 Drift ice
		Erstan Fjärd	5 Packed ice
		Vidskär Fjärd	6 Close packed drift ice
		Around Utö	7 Rift in the ice parallel to the coast
		The outer sea off Utö	8 Screwed ice
		Skiftet	9 Coarse ice masses
		At Led sund	X No information
		The sea off Marichamn	
		The Archipelago of Raumo	N = Effect on Navigation
		The inner sea off Raumo	0 Navigation unobstructed
		Vicinity of Relandersgrund	1 Navigation unobstructed for
		Mäntyluoto Harbour and	steamers; difficult for sailing vessels
		neighbourhood	2 Navigation difficult for small
		Off Kallo and Räfsö	steamers; dangerous for sailing
		The outer sea off Räfsö	vessels
		Fairway Rönnskär—Vasa	3 Navigation only possible for large
		Fairway Norrskär—Vasa	steamers without ice breaker
		Archipelago off Jacobstadt	4 Navigation only possible for steamers
		The sea off Jacobstadt	strengthened for ice, without help
		Fairway to Toppila (Ulcaborg)	of ice breaker
		Fairway to Kemi	5 Navigation channel kept open
			6 Navigation channel kept open with
			the assistance of ice breaker
			7 Navigation interrupted
			8 Sea mist, fog or snow
			9 Navigation closed
			X No information
			The message may be abbreviated as
			follows:—
			(1) If the ice and navigation con-
			ditions of all the areas of one main
			group are the same, the message gives
			after the pair of letters (AA or BB, etc.)
			only one pair of symbols IN, e.g., AA 34
			(2) If the ice and navigation con-
			ditions of all the areas of several
			successive main groups are the same,
			only the pairs of letters, followed by
			only one pair of symbols will be issued,
			e.g., BB CC DD OO
			(3) When there is no need to issue
			warnings for a whole main group, this
			group will be omitted
			NOTE.—If the conditions of a whole
			main group are unknown, this group
			will not be omitted, but treated as
			under (1), e.g., FF XX
Hangö, OJD, 600 sp. . .	.. request	(As above) . . .	Repeat of Helsingfors message to
			vessels under way. This station will
			also answer any questions concerning
			the Ice Code

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
FRANCE			
Nantes, UA, 2,800 sp. ..	0800 1600 2100	[Urgent general notices issued by the Hydrographic Service]	The warning message will be repeated daily for a week if necessary
Dunkerque, FUD, 600 sp. ..	request		
Le Havre, FFH, 600 sp. ..	request		
Cherbourg, FUC, 600 sp. ..	request	English Channel	
Ouessant, FFU, 600 sp. ..	request		
Brest, FUE, 600 sp. ..	—	English Channel and North At- lantic	
Lorient, FUN, 600 sp. ..	request	North Atlantic	
Rochefort, FUR, 600 sp. ..	request	North Atlantic	
Bordeaux (Le Bouscat), FFX, 600 sp. ..	request		
St. Marie de la Mer, FFS, 600 sp. ..	request		
Porquerolles, FUQ, 600 sp. ..	—	Western Mediterranean	
Bonifacio, FFC, 600 sp. ..	request		

REGULATIONS CONCERNING W T NAVIGA- TIONAL WARNINGS FOR FRANCE, ALGERIA AND TUNISIA.

Important information of an urgent character concerning navigation is transmitted by the French W/T stations enumerated below.

The information will include particulars of light-vessels adrift or seriously damaged; lights extinguished or damaged; establishment of temporary lights; wrecks and derelicts dangerous to navigation; floating mines, approximately between the French coast and the meridian 30° W. of Greenwich, and the parallels of 43° N. and 52° N. (English Channel and North Atlantic areas), and as far as the meridian of 12° E. of Greenwich.

Western Mediterranean area). Also, any other information valuable to the navigator outside the limits of the zones of obligatory pilotage, which has not already been issued through the medium of the ordinary French Notices to Mariners.

Method of Signalling.—The message will commence with—

TTT AVURNAV

which indicate the sending of urgent messages concerning the safety of navigation; followed by the text of the notice in French and *en clair*.

Approximate geographical positions will be given in latitude and longitude (Greenwich) in the form of three groups as follows:—

- The first and second groups consist of four figures each, representing the degrees and minutes of latitude and longitude, respectively. (If the number of degrees or minutes is less than 10, the tens figure is signalled as 0; if the number of degrees longitude exceed 99, the hundreds figure is omitted.)

(b) The third group consists of two letters (E, N, S, or W) expressing the direction of latitude and longitude.

If the exact position is signalled it will be by bearing (0°-360°) and distance (nautical miles) to an accurately determined point.

Form of Message.—Suppose that Brest has to signal on January 10th at 22h. 20m. that there is a danger of floating wreck in 48° 40' N., 8° 05' W.

The message will be worded thus:

TTT. AVURNAV, Brest. Epave flottante dangereuse
4840 — 0805 — NW — 2220/10/1.

Transmission will take place twice daily, and continue for a week if necessary. The original time and date of the message is always repeated.

The messages are broadcasted gratuitously by the following W/T stations:—Cherbourg—Rouges Terres; Brest—Mengam, Lorient—Pen Mané, Rochefort—Porquerolles, Bizerta—Seti Meriem, and Oran—Ain Turk.

W/T stations also repeat the navigational warnings request. In this case a charge of 6 francs (gold) is made for each message, unless "Néant" (nothing reported) is sent.

NOTE.—In order to provide a rapid and efficient service it is important to have the co-operation not only of the coastal authorities but equally that of ships at sea. To effect this, masters of vessels encountering any danger to navigation are requested to immediately inform all ships in the vicinity, and also the authorities at the nearest port; and if equipped with W/T installation to at once transmit the intelligence to the nearest coast W/T station, preceding the message with the safety signal (TTT), addressing it to the Prefect of Maritime, and endorsing it with the name and ownership of the ship.

(1) FRENCH INDO-CHINA

(1)	(2)	(3)	(4)
Fu-Kop, FPK Pulo-Condore, FPR Mitho, FCA	request 0400 1800*	Coasts of Cochin-China and Cambodia	
All 600 sp.			
Tourane, FLT	0400 1800*	Coast of Annam	
Kien-An FKA	request 0400 1800*	Gulf of Tong-King	
	request		

These messages will give particulars of light vessels adrift or seriously damaged; lights extinguished or damaged; establishment of temporary lights; wrecks or derelicts dangerous to navigation; floating mines, etc., comprised approximately between the coast of French Indo-China, meridians of Long. 102° and 112° and Lat. 6° N.

The message will give the time of issue, and will be repeated twice daily for a week, if considered necessary.

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.																																																												
(1)	(2)	(3)	(4)																																																												
ENCH INDO-CHINA—contd.																																																															
rt Bayard, FWA, 1,800 c.w.	request	Gulf of Tong-King	<p>Certain stations only transmit the warnings on request. In this case the message will be subjected to a fixed charge of 6 francs (gold), debited to the ship concerned. If, however, the message reads "Néant" (nothing to report), no charge is incurred.</p> <p>These warnings are issued by the Commandant de la Marine, French Indo-China</p>																																																												
ERMANY																																																															
onigswusterhausen, LP, 5,250 c.w.	0840	<p>GERMAN COASTS—NORTH SEA AND BALTIC</p> <table><tr><th>Reporting Station</th><th>Areas affected</th></tr><tr><td>Brüsterort</td><td>— Sea Channel</td></tr><tr><td>Pillau</td><td>— Harbour and roadstead</td></tr><tr><td>Swinemünde</td><td>— do.</td></tr><tr><td>Travemünde</td><td>— do.</td></tr><tr><td>Holtenau</td><td>— Kiel Canal at Brunsbüttel</td></tr><tr><td>Brunsbüttelkoog</td><td>— Off lying area in the Elbe</td></tr><tr><td>Hamburg</td><td>— do.</td></tr><tr><td>Brake (Weser)</td><td>— Off lying area in the Weser</td></tr><tr><td>Nesserland (Ems)</td><td>— Off lying area in the Ems and harbour</td></tr></table>	Reporting Station	Areas affected	Brüsterort	— Sea Channel	Pillau	— Harbour and roadstead	Swinemünde	— do.	Travemünde	— do.	Holtenau	— Kiel Canal at Brunsbüttel	Brunsbüttelkoog	— Off lying area in the Elbe	Hamburg	— do.	Brake (Weser)	— Off lying area in the Weser	Nesserland (Ems)	— Off lying area in the Ems and harbour	<p>(Winter months only)</p> <p>JKJKJK JKJKJK JKJKJK</p> <p>Where J = Ice conditions</p> <table><tr><td>0</td><td>Open water</td></tr><tr><td>1</td><td>Thin loose ice</td></tr><tr><td>2</td><td>Drift ice</td></tr><tr><td>3</td><td>Thin covering of ice</td></tr><tr><td>4</td><td>Close pack ice</td></tr><tr><td>5</td><td>Difficult drift ice</td></tr><tr><td>6</td><td>Thick covering of ice</td></tr><tr><td>7</td><td>Heavy drift ice</td></tr><tr><td>8</td><td>Heavy masses of ice</td></tr><tr><td>9</td><td>Not known</td></tr></table> <p>K = Effect on Navigation</p> <table><tr><td>0</td><td>Conditions not known owing to fog, snow, etc.</td></tr><tr><td>1</td><td>Navigation practicable</td></tr><tr><td>2</td><td>Navigation difficult for sailing vessels</td></tr><tr><td>3</td><td>Navigation difficult but practicable for sailing vessels assisted by tugs</td></tr><tr><td>4</td><td>Navigation very difficult; closed to sailing vessels</td></tr><tr><td>5</td><td>Navigation only practicable for large steamers</td></tr><tr><td>6</td><td>Navigation only practicable with the assistance of ice breakers</td></tr><tr><td>7</td><td>Navigation closed</td></tr><tr><td>8</td><td>Navigation channel kept open by ice breakers</td></tr><tr><td>9</td><td>Not known</td></tr></table>	0	Open water	1	Thin loose ice	2	Drift ice	3	Thin covering of ice	4	Close pack ice	5	Difficult drift ice	6	Thick covering of ice	7	Heavy drift ice	8	Heavy masses of ice	9	Not known	0	Conditions not known owing to fog, snow, etc.	1	Navigation practicable	2	Navigation difficult for sailing vessels	3	Navigation difficult but practicable for sailing vessels assisted by tugs	4	Navigation very difficult; closed to sailing vessels	5	Navigation only practicable for large steamers	6	Navigation only practicable with the assistance of ice breakers	7	Navigation closed	8	Navigation channel kept open by ice breakers	9	Not known
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rkum, KBM, 600 sp.	0300 0700 1100 1500 1900 2300	North Sea coast	<p>Warnings will be transmitted immediately upon receipt and afterwards at the fixed times stated. The Ice Reports furnished by the German Sea Ob. at Hamburg are also sent on request</p> <p>Code: As for Königswusterhausen (The text of the message is sent three times and is then repeated by R/T)</p> <p>N.B.—This station should only be called when a vessel is unable to get through to Cuxhaven (q.v)</p> <p>JKJKJK JKJKJK, etc. (7 groups)</p> <p>Code: As for Königswusterhausen</p>																																																												
rdleieh, KAV, 600 sp. 1,800	1015*	<p>NORTH SEA COAST</p> <table><tr><th>Reporting Stations</th><th>Areas affected</th></tr><tr><td>List</td><td>—</td></tr><tr><td>Husum</td><td>—</td></tr><tr><td>Tönning</td><td>—</td></tr><tr><td>Cuxhaven</td><td>— Off the Elbe</td></tr><tr><td>Cuxhaven</td><td>— Haven and entrance</td></tr></table>	Reporting Stations	Areas affected	List	—	Husum	—	Tönning	—	Cuxhaven	— Off the Elbe	Cuxhaven	— Haven and entrance																																																	
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R T	request	<p>Brunsbüttelkoog—Canal entrance</p> <p>Glückstadt</p> <p>Hamburg</p> <p>Harburg</p> <p>Hoheweg</p> <p>Bremerhaven</p> <p>Bremen</p> <p>Aussenjade</p> <p>Innenjade</p>																																																													

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
GERMANY — <i>contd.</i>			
		Wilhelmshaven — Haven en- trance	
		Borkum, — Wester Ems	
		Nesserland — Off the Ems	
		Nesserland — Haven	
		Kaiser Wilhelm Canal	
		Kiel Förde	
		Marienleuchte — Fehmarnbelt	
Wilhelmshaven (3rd entrance), KAN, 600 sp.	request	North Sea coast	Hamburg Sea Ob. reports
Swinemünde, KAW, 600 sp., 1,800 R/T	1030* request	BALTIC SEA. Memel Pillau Königsberg—Sea canal Danzig Stolpmünde Kolberg Swinemünde—Off Sea Swinemünde—Haven Stettiner Haff Thiessow Arkona Barhöft Warnemünde Wismar—To Channel Travemünde Marienleuchte, Fehmarnbelt Fehmarnsund Bülk Kaiser Wilhelm Canal Rendsburg—Eider Flensburg, Innenförde Swinemünde <i>only</i>	(The text of the message is sent three times and then repeated by R/T JKJKJK JKJKJK etc. (7 groups) Code: as for Königswusterhausen
1,000 sp.	0725*		Special Code below:— "Eis" — followed by one or more of the following letters: Code. Meaning a Open water b Thin loose ice c Drift ice d Thin covering of ice e Close pack ice f Difficult drift ice g Thick covering of ice h Heavy drift ice i Heavy masses of ice k Loose floating ice l Conditions not known owing to fog, snow, etc. n Navigation practicable o Navigation difficult for sailing vessels p Navigation difficult but practicable for sailing vessels assisted by tugs q Navigation very difficult; closed sailing vessels r Navigation only practicable for large steamers s Navigation only practicable with the assistance of ice breakers t Navigation closed u Navigation channel kept open by ice breakers
List, KAL, 600 sp.	request	North Sea coast	Hamburg Sea Ob. reports
Cuxhaven, KCX	request	North Sea coast	Code: As for Königswusterhausen
Nauen, POZ, 4,700 c.w. . . .	0000* 1200*	—	Message in German, English and French
Pillau, KAP, 600 sp. . . .	request	Baltic	Repeat of Swinemünde report
Friedrichsort, KBK, 600 sp.	request	Baltic	Do. do. Also, Ice reports for the Baltic issued by other countries

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
GREAT BRITAIN AND IRELAND			
Fishguard, GRL	0330 0910 1530 2100	St. George's Channel and Bristol Channel	Navigational warnings issued by the Admiralty, containing information re- lating to derelicts, temporary extinction of lights or displacement of principal aids to navigation, drifting mines, ice reports and warnings, etc. All these stations broadcast at stated times and <i>also immediately upon receipt</i> <i>of information</i>
Lands End, GLD	0200 0800 1400 2000	English Channel and Bay of Biscay	
Port Patrick, GPK	0330 0910 1530 2100	North Channel and Firth of Clyde	
Wick, GKR	0200 0800 1400 2000	North Sea and Pentland Firth	
Cullercoats, GCC	0330 0910 1530 2100	North Sea	
North Foreland, GNF	0200 0800 1400 2000	English Channel and North Sea	
Valencia, GCK	0330 0910 1530 2100	Atlantic — ..	
Malin Head, GMH all 600 sp.	0200 0800 1400 2000	Atlantic	
Seaforth, GLV, 600 sp.	request	Port of Liverpool ..	
Niton, GNI, 600 sp.	request	Port of Southampton ..	
HAITI REPUBLIC			
Port au Prince, NSC, 2,250 sp.	0100 1300 1700 2100	—	—
HAWAIIAN ISLAND			
Honolulu, Pearl Harbour, NPM 2,250	0630 1830	—	Also furnished on request
HOLLAND			
Scheveningen, PCH, 1,800 sp.	1115* 2315	—	Navigational warnings sent in Dutch and English; the advice in Dutch being preceded by the letters NBAZ. If there is no advice to navigators, the message will consist only of W.R. pre- ceded by the letters KNMI
ITALY			
Rome (Centocelle), ICD, 2,250	0630	—	—
Pola, IQZ, 3,000	0530 2030	—	—
JAPAN			
Keelung (Formosa), JFK	as required	—	—
Dairenwan (Kwang Tung), JDA	do do	—	—
Otechishi, JOC	do	—	—
Choshi, JCS	do	—	—
Shiomisaki, JSM	do	—	—
Shimotsui, JSX	do	—	—
Tsunosima, JTS	do	—	—
Osesaki, JOS	do	—	—
(all 600 sp.)			

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.	
(1)	(2)	(3)	(4)	
LATVIA				
Libau, KCB, 1,200 sp. ..	0720* and request	Group I 1. Libau 2. Windau 3. Michael Light- house Group II 1. N.W. of Domes- ness 2. N.E. of Domes- ness 3. S.E. of Domes- ness Group III 1. Off Riga (sea) 2. Riga (port) 3. Haimasch	Ice reports in International Code (1) Issued daily in winter, ex- Sundays and holidays (2) Reports based on ob. at 0530, G.M.T. (3) Reports also issued on req- <i>en clair</i> (English). A charge is for this message. Ships should whether it is required in code or <i>en c</i> signalling "whole MSG" or the ticular group required, as for inst "only for Riga gulf." Navigational warnings, mine w- ings, also sent when necessary.	
	0745			
MEXICO				
Mazatlan de Sinaloa, XAE ..	1837	—	NAVIGATIONAL WARNINGS. Mexican W/T stations inter- messages containing notices to mari- emanating from foreign W/T stati- These messages are broadcasted three consecutive days according to information given below. Mess- containing information relating navigational dangers, received ships at sea, are dealt with in a sim- manner	
Campeche, XAB ..	1837	—		
Vera Cruz, XAA ..	1837	—		
Mexicalia ..	1900	Broadcast navigational warn- ings issued by W/T stations between San Francisco and the Mexican boundary		
Hermosillo, XAH ..	1900	Broadcasts navigational warn- ings issued by W/T stations situated between Rio Suchiate and Balboa		
Salina Cruz, XAN ..	1900	Broadcasts navigational warn- ings issued by W/T stations between Rio Bravo and Florida; also by Cabo San Antonio W/T station		
Tampico de Tamaulipas, XAJ	1900	Broadcasts navigational warn- ings issued by W/T stations between Rio Bravo and Florida; also by Cabo San Antonio W/T station		
Payo Obispo, XAC ..	1900	Broadcasts navigational warn- ings issued by W/T stations between Colon and Merida; and also by Cuban W/T stations		
Merida de Yucatán, XAM ..	—			
(all above 600 sp.)				
MOROCCO				
Casablanca (Chetaba), CNP, 600 sp.	1200	Various ports of Morocco	<i>En clair</i> (English). Reports cerning the state of the sea at 0700	
Tangier, CNW ..	request	Urgent notices to mariners con- cerning derelicts, floating mines, extinguished lights, etc., are transmitted to ships on request A charge of 6 francs (gold) is debited to the ship on account of the message. If, however, the message reads "Néant" (nothing to report) no charge is incurred Tangier and Casablanca W/T stations give continuous ser- vice; Mogador is open from 0600 to 2400 G.M.T.		
Casablanca, CNP ..	request			
Mogador, CNY ..	request			
All 600 sp.				
NEW BRITAIN				
Rabaul, VJZ, 600 sp. ..	request	Local	See under Australia: "Navigati- Warnings."	
NEWFOUNDLAND				
Belle Isle, VCM ..	0230* 1430*	Gulf of St. Lawrence and Straits of Belle Isle	Ice reports and navigational warn- Also sent on request do. do. do.	
Cape Race, VCE ..	0215* 1415*	(1) Gulf of St. Lawrence (2) Nova Scotia and Newfound- land Coasts (3) North Atlantic		
Point Amour, VCL ..	request	—		do. do. do.
(all 600 sp.)				

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
ICARAGUA			
Ianagua, NAZ, 953	0100 1300 1700 2100	—	—
NORWAY			
Jan Mayen, JN, 600, 1,000, 1,600	—	Around the Island of Jan Mayen (lat. 70° 59' N., long. 8° 18' W.)	Ice reports occasionally sent in special code
PACIFIC ISLANDS			
Papette (Tahiti), FOP, 600 sp.	1100* 2300*	—	Only sent when necessary and added to weather report. Plain language messages in French and English
Tutuila, NPU, 2,250 sp. ..	0330 0730 2330	—	Dangerous obstructions to navigation. Information also furnished to passing vessels on request
PANAMA			
Colon, NAX, 1,620	1000* 1800*	Caribbean Sea	—
Balboa, NBA, 7,000 c.w. ..	1000* 1800*	Zone between the equator and lat. 20° 00' N.	—
PORTO RICO			
San Juan, NAU, 2,750 sp. ..	0100 1300 1700 2100	Local	—
RUSSIA			
Petrograd (New Holland), RAC, 1,600 sp.	0905 1715	Russian waters of the Gulf of Finland	The message, which is supplementary to the weather bulletin, begins with the word (Pilot) and the letters TTT. Then follows the text of the notice in Russian, concluding with the letters TTT. Immediately afterwards the message is repeated in English. It commences with the word "Pilot" and the letters TTT. Then the text of the notice is transmitted in English, con- cluding with the letters TTT
Archangel, RQA, 600 sp. ..	1500- 1600	White Sea from Syvatoi Nos to Modyugski	When there is no warning notice to transmit, the word "Her" will be given in place of the Russian text; and the word "None" instead of the English text
Sevastopol (Ukraine), RCT, 2,500	1200	Sevastopol, Eupatoria, Yalta, Kertch, Taganrog, Taupse	Following weather report during winter months only This information is sent <i>en clair</i> during winter months only as part of the weather report (q.v.)
RUSSIAN MARITIME PROVINCE			
Vladivostok, RCW, 360 ..	—	—	Ice signals

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
SWEDEN — <i>contd.</i>			
Hernösand, SAH, 600 sp. ..	1655 2155	Gulf of Bothnia	Ice warnings are issued by the Pilotage Department.
Vaxholm, SAF, 600 sp. ..	1650 2150	Southern and Northern Baltic and Gulf of Finland	
Gotland, SAE, 600 sp. ..	request	Do. do.	
Karlskrona, SAA, 600 sp. ..	request	From Kullen Lighthouse to Salmis Pilot Station	
Göteborg, SAB, 600 sp. ..	1700 2200	The Skagerrak, Kattegat, and Oresund	
TUNIS			
Bizerta Seti-Meriem, FFW, 600 sp.	request	Western Mediterranean ..	—
URUGUAY			
Cerrito (Monte Video), CWA, 600	—	—	—

U.S.A.

UNITED STATES NAVIGATIONAL WARNINGS: PROCEDURE.

The procedure, as far as masters of vessels are concerned, is divided into two parts:

- Sending hydrographic information to the U.S. Naval W T stations.
- Receiving information twice daily when within range of the distributing W T station of its zone.

Information will not be broadcast unless danger to a vessel is involved, either from collision or a resulting inadequacy of aids to navigation.

All hydrographic information, which includes reports on ice, wrecks, derelicts, floating obstructions, and important changes in aids to navigation, should be addressed to the Hydrographic Office and any of its branch offices by mail, and to any of the following naval radio stations by radio, addressed "Govt. Hydro."

U.S. naval radio stations	Call letters	U.S. naval radio stations	Call letters
<i>Atlantic Ocean</i>		<i>Pacific Ocean</i>	
Boston	NAD	Balboa	NBA
New York	NAH	San Francisco ..	NPG
Philadelphia ..	NAI	North Head	NPE
Norfolk	NAM	Seattle	NVL
Baltimore	NBZ	<i>Great Lakes</i>	
Charleston	NAO	Duluth	NUX
New Orleans ..	NAT	Chicago	NVR
Galveston	NKB	Buffalo	NNZ
St. Thomas, Virgin Islands	NAV	Cleveland	NRH
San Juan	NBB		
Navassa Island ..	NAW		
Guantanamo, Cuba	NKC		
Colon	NAX		

U.S.A.—*contd.*

REPORTING DERELICTS AND VESSELS IN DISTRESS.

It frequently happens that masters of vessels, when sighting derelicts or vessels in distress, and in reporting them by radio, fail to observe and report essential data as to the condition of the craft, necessary before a search is begun by a United States Coastguard cutter. In consequence of this neglect it frequently becomes necessary for the searching cutter to send radiograms in an effort to obtain the necessary information. To be complete, information concerning a derelict should state :

- (a) The general condition of the vessel.
- (b) Whether bottom up or awash.
- (c) Height of hull above water and any abnormal conditions as to buoyancy.
- (d) As to whether masts are standing, sails set, or otherwise.
- (e) Force and direction of wind.
- (f) Any observed current, its set and strength.

Similar descriptive information should also be furnished of vessels in distress. This information is necessary in order to determine roughly the direction and speed of drift of the derelict or vessel, and also to give an idea of the appearance of the object sought

All the U.S. Naval W T stations mentioned in the foregoing schedule are open at all times to receive reports concerning hydrographic information from masters of vessels. The messages are to be endorsed "Govt. Hydro," and *transmitted in plain language*, direct to the W T station which disseminates the information relating to the area affected, as soon as the vessel is within normal range.

In preparing information for transmission, it is desired that messages be concise as consistent with exactness and clearness. The order of the message will be in the order of the importance of the items. To promote uniformity the following order of subjects is recommended :—

- 1. Derelicts and sunken wrecks.
- 2. Mines.
- 3. Ice.
- 4. Aids to navigation adrift.
- 5. Floating rafts, logs, wreckage.
- 6. Misplaced buoys in approaches to harbours.
- 7. Other items considered sufficiently important to broadcast.

NOTE.—Vessels in the Caribbean Sea and West Indian waters north of the parallel of lat. 15° 00' N. should report to any of the under-mentioned W T stations, which will transmit the information, via West Key, to Savannah and New Orleans W T stations :—

Country.	Name of W/T station	Call Signal
Virgin Islands	St. Thomas	NBB
Porto Rico	San Juan	NAU
Cuba	Guantanamo	NAW
Windward Passage	Navassa I	NKC

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
Puget Sound, NPC, 1,988 sp.	0300 1700 2100	Zone north of lat. 46° 00' N. including Vancouver and Queen Charlotte Sounds and Alaskan waters	—
North Head (Washington) 2,700 sp.	0130 0430 0530 1330 1730 1955* 2130	Zone included between lat. 42° 00' N. and 46° 00' N.	—

Country, Station, Call. Wavelength.	Time of sending G.M.T.	Area covered by Report.	Codes and Notes.
(1)	(2)	(3)	(4)
U.S.A.—<i>cont'd.</i>			
San Francisco, NPG, 1,908 sp. 4,650 c.w.	0555* 1455* 1700	Zone included between lat.. 33° 00' N. and 42° 00' N.	—
Galveston (Texas), NKB, 1,630 sp., 2,300 c.w.	0330 0500* 0600 1955*	Gulf of Mexico, West of the line, Ship Shoal Light (La.), and Cape Catoche (Yutatan)	—
Charleston (S.C.), NAO, 2,250 sp.	1530 2300	Zone South of lat. 33° 00' N. and N.E. of a line joining Cape Sable (Fla.), and Cay Piedras (Cuba)	—
Norfolk (Va.), NAM, 1,851 sp.	0100 1330 1545 2100	Zone included between the parallels of lat. 38° 30' N. and 33° 00' N., the entrance to Chesapeake Bay, Hampton Roads, Newport, News and Norfolk	Broadcasts all information relating to ice and its movement in the North Atlantic, which is received from the U.S. Coastguard Cutter on the N. Atlan- tic Ice Patrol
Washington (Arlington), NAA, 2,650 sp., 5,950 c.w.	0255 1530*	—	Do. do.
Philadelphia, NAI, 1,948 sp.	1545 2200	* Zone included between the parallels of lat. 39° 30' N., and 38° 30' N., including Delaware River and Delaware Bay*	—
Boston (Mass.), NAD, 1,620 sp.	1600 2200	Zone S. of lat. 45° 00' N., and N.E. of a line joining Point Judith and Nantucket Shoal Light-vessel, and N. of parallel of Nantucket Shoal Light-vessel	Do. do.
New York, NAH, 1832	1530 2200	Zone included between the parallels of lat. 42° 00' N., and 39° 30' N. NOTE.—This zone inten- tionally overlaps the Boston zone	North Atlantic Ice report from the U.S. Coastguard Cutter on N. Atlantic Ice Patrol
New Orleans, NAT, 1,832 sp.	0300 1530 1600 1700* 2200	Gulf of Mexico between the line, Cape Sable (Fla.), and Cay Piedras (Cuba), and the line, Ship Shoal Light (La.), and Cape Catoche (Yucatan), in- cluding the Yucatan Channel	—
Key West, NAR, 1,988 sp., 5,700 c.w.	0300*	—	—
Annapolis, NSS, 17,145 c.w.	2200	—	North Atlantic Ice report received from the U.S. Coastguard Cutter on N. Atlantic Ice Patrol
Cleveland (Ohio), WTK, 706 sp.	1515 2145	The Lower Lakes	—
Great Lakes (Ill.), NAJ, 4,650 c.w. for 1545 and 2200 mes- sages; 1,988 sp. for 1600 and 2215 messages	1545 1600 2200 2215	—	—
Detour Point (Mich.), NZU, 600 sp.	1600 2215	—	—
Whitfish Point (Mich.), NZT, 600 sp.	1600 2215	—	—
Grand Marais (Mich.), NZT, 600 sp.	1600 2215	—	—

Country, Station, Call, Wavelength.	Time of sending G.M.T.	Codes and Notes.
(1)	(2)	(3)
U.S.A.—contd.		
Coastguard Cutters "Tampa" (NITC) or "Modoc" (NIVD) (North Atlantic Ice Patrol Service)	—	The International Ice Observation and Ice Patrol Service instituted for the purpose of observing the movement of ice in the vicinity of the Great Banks of Newfoundland, commences about April 1st of each year and continues throughout the season of dangerous ice conditions
600 sp. for 0000, 1100 and 2300 messages; 2,300 sp. for 0130 message.	0000	The patrol vessels transmit a message to the U.S. Hydrographic Office, Washington, defining the ice danger zone, its southern limits and other definite ice news
	1100	Ice information concerning the southern, eastern and western limits of the icebergs for the benefit of vessels. This message will be sent three times with an interval of 2 mins. between each
	2300	Ice information will also be given at all times to any ship with which the Patrol Vessel can communicate on 600 metres
	0130 request	Each message is sent in plain, concise English, and will state in the following order:— (a) Position of Patrol Vessel; (b) Location and description of ice; (c) Other data
		The time used in all messages is 75th meridian time (add 5 hours to obtain G.M.T.).
		The reports from the Patrol Vessel are also repeated at certain stated times by the undermentioned United States W/T stations (<i>q.v.</i>):— Norfolk, Washington—Arlington, Annapolis, New York (NAH), and Boston
		Masters of Vessels and others are requested to instruct their W/T operators to refrain, as far as practicable, from transmitting messages at the times given in the schedule
		The United States Coastguard cutters, "Tampa" and "Modoc," have been detailed for the Patrol Service, which they carry out alternately.
		The Ice Patrol Vessels special call sign is KFOG and this must not be confused with the regular call signals of these vessels.
		INSTRUCTIONS TO MASTERS OF VESSELS
		The movements of every approaching steamer between the meridians of Long. 55° W. and 43° W. are noted, and all special ice information requested by these vessels will be furnished
		The work of the Ice Patrol will be greatly facilitated if masters of vessels will wireless the following data to the Ice Patrol Vessel as soon as they are within working distance:
		(a) Icebergs or other obstructions sighted, giving date, time, latitude, longitude, and direction of drift if an iceberg, together with the sea temperature at the time
		(b) Surface temperature of the sea every four hours when between Lat. 39° N. and 48° N., and crossing Long. 52° W. and 44° W., either eastbound or westbound; and giving latitude and longitude, course, and speed at time of each observation.
		These data will enable the Ice Patrol Vessel to plot an accurate surface temperature chart of the area under observation, from which predictions can be made as to the probable movement of icebergs in the vicinity of the Tail of the Great Bank
		Arrangements have been made to broadcast the shift of steamship tracks on short notice if it becomes necessary
		Every steamer's position is plotted on a chart kept on board the Patrol Vessel, and by this means the track of each vessel is carefully followed as she crosses the ice danger zone
		By knowing the positions of all vessels within the vicinity of the Great Banks, the Ice Patrol Vessel can issue warnings to those found standing toward, or dangerously near to, icebergs
VIRGIN ISLANDS		
St. Croix, NNI, 450 sp. ..	0100	Hurricane warnings when issued repeated at 4 hour intervals
St. Thomas, NBB, 1,688 sp. ..	1300	
	1700	
	2100	
WINDWARD PASSAGE		
Navassa Island, NKC, 600 sp.	0100	
	1300	
	1700	
	2100	

(4)—GENERAL SECTION.

Union Radio Scientifique Internationale (U.R.S.I.).

The U.R.S.I. was founded in July, 1919, with the object of co-ordinating radio research on fundamental measurements and principles along International lines.

President of the Union: Général Ferrié (France).

Vice-Presidents: MM. Austin (United States), Eccles (Great Britain), Vanni (Italy).

General Secretary: M. Robert Goldschmidt (Belgium), 54, Avenue des Arts, Brussels.

The work of the Union is supervised by its various committees as follows:

- (1) High-frequency measurements and standard wavelengths. (Chairman, M. Abraham.)
- (2) Principles of wave propagation, variations in the electro-magnetic field, radio direction finding, etc. (Chairman, M. Austin.)
- (3) Atmospherics. (Chairman, Professor Eccles.)
- (4) Liaison with wireless operators and amateurs, in order to devise simple methods so that they can take part in useful researches. (Chairman, M. Vanni.)

In co-operation with the U.R.S.I., the high power stations at Nantes (call UA), Bordeaux (call LY), Eiffel Tower (call FL), and Coltano (call ICC) transmit carefully calibrated waves of standard frequency. Particulars of these, and other issues, are to be found below. In addition, it may be mentioned that the Radio Research Board of the Department of Scientific and Industrial Research (16, Old Queen Street, Westminster, S.W.1), is co-operating with amateurs in carrying out investigations on "fading" of signals and would welcome assistance from those willing to help.

U.R.S.I. Signals.

Since February 1st, 1922, the following French stations have transmitted U.R.S.I. signals. The transmissions are made *daily* at the times indicated below:—

(1) Eiffel Tower (FL)

Station particulars:

Latitude	.. .. .	48° 48' N.
Longitude	.. .. .	2° 15' E.
Effective height of aerial	.. .. .	85 metres
Spark transmission:—		
(1) Wavelength	.. .. .	2,600 metres
(2) Frequency*	.. .. .	115,300 K.C.
Intensity of current in aerial	.. .. .	85 A.
Energy in aerial	.. .. .	55 K.w.
Resistance of aerial	.. .. .	7.6 ω .

Procedure.

At 1034 G.M.T. U.R.S.I. de FL . . . U.R.S.I. . . .
(exact wavelength and energy in aerial of previous day's transmission).

At 1036 G.M.T. Two minutes dash.

At 1038 G.M.T. Preparatory signals preceding the ordinary semi-automatic T.S. of 1045.

* Frequency is expressed in "kilo-cycles" (K.C.), this term denoting "thousands of complete cycles per sec." The formula connecting wavelength and frequency is:—

$$\text{Wave (in metres)} = \frac{3 \times 10^8}{\text{K.C.}}$$

(2) *Bordeaux (La Fayette)*. (L.Y).

Station Particulars:—

Latitude	.. .. .	44° 42' N.
Longitude	.. .. .	0° 48' W.
Effective height of aerial	.. .. .	170 metres
Poulsen arc transmission:		
(1) Wavelength	.. .. .	23,450 metres
(2) Frequency*	.. .. .	12,800 K.C.
Intensity of current in aerial	.. .. .	480 A.
Energy in aerial	.. .. .	300 K.w.
Total resistance of aerial	.. .. .	1.17 ω .

Procedure.

At 1955 G.M.T. URSI de LY URSI de LY
 (Exact wavelength and energy in
 aerial of previous day's transmission).

At 1956 G.M.T. Two minutes dash.

At 1958 G.M.T. Preparatory signals preceding the
 scientific T.S. (rhythmic beats) of 2000.

(3) *Nantes. (UA)*.

Station particulars:—

Poulsen arc transmission wavelength. .9,000 metres.

Procedure.

At 1415 G.M.T. URSI de UA URSI de UA
 (Exact wavelength and energy in aerial
 of previous day's transmission).

At 1416 G.M.T. Two minutes dash.

NOTE.—In the absence of accurate information as to the exact wavelength and energy in aerial of the transmissions of the previous day, a series of the letter "x" will be transmitted in place of these figures.

Calibrated Waves.

Transmission of calibrated waves is made by the undermentioned stations (in addition to those given above under U.R.S.I. signals):—

(1) *Eiffel Tower (FL)* on the 1st and 15th days of each month.

Calibration wave = 5,000 metres.

Procedure: C.W. transmission (energy in aerial about 60 k.w.).

From 1800-1801 (G.M.T.) • — • — • — • — etc.

At 1801 (G.M.T.) three-minute dash (5,000m. wave).

Calibration wave = 7,000 metres.

From 1810-1811 (G.M.T.) — • • • — • • • — • • •
 etc.

At 1811 (G.M.T.) three-minute dash (7,000 m. wave).

It is impossible to ensure the transmission of rigorously exact wavelengths. Very precise measures of the waves as they are received are made in the laboratories of the "Invalides" at Paris, and the corrections to be applied are thus determined. The station at Lyons (see below) transmits the exact length of these waves at 1900 G.M.T.

(2) *Lyons (YN)* on the 1st and 15th days of each month.

Calibration wave = 10,000 metres.

Procedure: C.W. transmission (energy in aerial about 100 k.w.)

From 1820-1821 (G.M.T.) — • — • — • — • — • — •
 etc.

At 1821 (G.M.T.) three-minute dash (10,000 m. wave).

Calibration wave = 15,000 metres.

From 1830-1831 (G.M.T.) — • • — • • — • • , etc.

At 1831 (G.M.T.) three-minute dash (15,000 m. wave).

TRANSMISSION OF CORRECTED VALUES FOR THE FOUR WAVES ABOVE (*i.e.* 5,000, 7,000, 10,000 and 15,000 metres), on 15,000 C.W.

Procedure: At 1900 (G.M.T.) a series — • — • — • , followed by — • — • — • — • — • (C.Q.) — • — • — • (a group of figures giving the exact wavelength of first wave, approximately 5,000 m.); (a group approximately 7,000); (a group approximately 10,000); (a group approximately 15,000). The whole message is sent three times in succession.

(3) The Air Ministry (GFA) transmits a series of calibrated waves *daily at times shown.*

Time G.M.T.	Wave-length C.W.	Call Signs.	Signal.	Correction.
0745	1400	CQV GFA	A series of figures 1 (• — — —) for 30 sec., followed by a single dash (—) lasting 5 sec.	Immediately following the 5 sec. dash any necessary correction will be transmitted as follows:—
0750	900	CQV GFA	A series of figures 3 (• • • — —) for 30 sec., followed by a single dash (—) lasting 5 sec.	If no correction is necessary, VA will be made after the 5 sec. dash.
0800	1680	CQV GFA	A series of figures 2 (• • — — —) for 30 sec., followed by a single dash (—) lasting 5 sec.	Indicating figure for the wave (<i>i.e.</i> , "1," "2,") B.T., followed by a 4-figure group, indicating the actual wave-length transmitted.

(4) *Devizes* GKU.

Calibration Wave 2,100 metres.

The Post Office Station at Devizes transmits a calibration wave daily at 0444, 0844, 1244, 1644 and 2044 G.M.T. consisting of a prolonged dash lasting 1 minute. This is to enable ships to accurately tune their instruments to 2,100 metres. The standard wave will be emitted towards the end of the period of 10 minutes, viz.: 35-46 min. past the hour G.M.T. during which ships using long wave C.W. are at present required to keep watch on 2,400 metres. Devizes will ask ships to "stand by" until 44 min. past the hour for the standard wave on 2,100 metres.

(5) *Coltano (Italy)*, call ICC.

Calibration wave 10,750 metres.

This station transmits a calibrated wave daily at 1700 G.M.T.

(6) *Washington, D.C. (U.S.A.) Bureau of Standards station*, call WWV.

(a) The Bureau of Standards sends out *periodically* accurately calibrated waves ranging from 175 to 2,000 metres (approx. limits). The accuracy of the emitted waves is usually greater than 0.3 per cent. and particulars of the transmissions are published in advance in "The Radio Service Bulletin."

The procedure adopted is as follows :—

A complete frequency transmission will include (1) a "general call," (2) a "standard frequency signal" and (3) "announcements."

The general call will be given at the beginning of the 8 minute period and will continue for about 2 minutes. This will include a statement of the frequency. The standard frequency signal will be a series of very long dashes with the call letters WWV intervening. This signal will continue for about 4 minutes. The announcements will be on the same frequency as the standard frequency signal just transmitted and will contain a statement of the measured frequency. There will be a 4 minute interval while the transmitting apparatus is adjusted for the next frequency.

All transmissions will be by unmodulated continuous wave telegraphy, and no announcements will be made by voice.

(b) The Bureau also measures the waves emitted by broadcasting and other stations in the U.S.A. and publishes from time to time in the "Radio Service Bulletin" the results of these measurements.

Transmission of Earthquake News by W/T.

Seismological Radiotelegrams.

It seldom happens that rapid communication of seismological observations is seriously needed, because the accurate location of an epicentre is best undertaken when all the information relating thereto is available. At present the rôle of W/T is that of providing a means of roughly checking the reliability of information in a report, which, from the records of local instruments, appears to be misleading.

(I) DETAILS OF SEISMOLOGICAL REPORTS TRANSMITTED BY THE EIFFEL TOWER (FL).

These reports give information regarding earthquake disturbances registered by the seismographs at the Geophysical Observatory at Strasbourg, or transmitted thereto by any of the co-operating seismological observatories at Algiers, Athens, Barcelona, Brussels, Coimbre, Oxford, Paris, Rome, Zurich and Wei-hai-Wei (China).

The messages are sent when necessary either (a) after the 1920 G.M.T. Synoptic Weather Report, or (b) at the end of the 1005 G.M.T. International Collective Report. Transmission is made on a wavelength of 2,600 metres (musical spark), and the energy in the aerial is approximately 60 kw.

Form of Message.

There are three forms of report varying with the nature and extent of the disturbance :—

- (a) Reports giving information regarding slight movements of the earth's crust or quakes of very feeble intensity. These reports are preceded by the words "Sismo Strasbourg," followed by a message *en clair* (in French) giving the particulars.

Example : "Sismo Strasbourg" le 28 mai, longues ondes vers 20h. 12m., maximum NS, 20h. 26m. Séisme lointain 21h. 05m., 46s.; maximum 21h. 44m.

- (b) The message also frequently gives particulars of micro-seismic disturbances. These minute disturbances may be due to the passage of atmospheric depressions over the land or the breaking of waves against the cliffs or a combination of the two causes. Reports from other French observatories are often included.

Example : "Sismo Strasbourg" du 6 ou 7 juin, agitation croît légèrement. Briançon signale secousse du degré 4^e durée 2 secondes à 8h. 20m.

(c) Important earthquake disturbances are transmitted in the following code :—

ddaap phhmm ssttt D_1D_1DDD .

where the symbols have the following meanings :—

dd = day of month.

aa = azimuth of epicentre from 10° to 10° counting from N. through E (01-36), based on any *clear* indications of the trace on the seismograph(s). The addition of 50 (*i.e.*, figures 51-86) indicates that the azimuth is uncertain by $\pm 180^\circ$. The figures 91-98 are used to indicate that the direction is vague and estimated only to the nearest 45° ; 99 means that no azimuth determination has yet been made; 00 that it seems impossible.

pp = refer to phases, P being the primary wave (code figures 1-4) and S the secondary wave (code figures 5 to 8).

	1	2	3	4
Phase P	iP very clear trace of P waves	P and \bar{P} clear	P clear	eP beginning badly defined on trace.
	5	6	7	8
Phase S	iS very clear trace of S waves	S clear	eS beginning badly defined on trace	uncertain

For disturbances near at hand (*i.e.*, when the epicentre is less than 700 km. distant), waves represented by the symbol \bar{P} are noted. These waves travel in a different layer of the earth's crust from P waves and less rapidly. The figure 9 for either P or S indicates that the minute signal interferes with the beginning (the pen which makes the trace on the recording ribbon being out of contact at this moment).

hh, mm, ss are the hours, minutes and seconds of the beginning of P.

ttt is the difference in seconds of the times of arrival of the S and P waves, *i.e.*, (S-P) in sec.

D_1D_1 is the difference ($\bar{P} - P$) in seconds for close earthquakes; if this difference is not clear on the trace, D_1D_1 is replaced by 99.

DDD is the distance in kilometres for close earthquakes.

D_1D_1DDD is the distance in kilometres for distant quakes.

NOTE.—The region of the epicentre is given *en clair* whenever possible together with an indication of the intensity of the disturbance.

Example :—20991 50051 33393 04830 Turkestan.

Translation: Disturbance on the 20th, azimuth of epicentre not yet determined, iP, iS beginning at oh, 51m. 33s., difference S-P = 393 sec.; distance 4,830 km.; epicentre Turkestan.

(II) REPORTS TRANSMITTED BY BORDEAUX (LY).

Important seismological radio-telegrams (*i.e.*, those in code (c) above) are repeated by Bordeaux on a wavelength of 18,940 C.W., at the conclusion of the scientific T.S. (rhythmic beats) at 2,000 G.M.T.

(III) REPORTS TRANSMITTED BY ZIKAWEI OBSERVATORY
(near Shanghai, China) FFZ, 600 sp.

In cases where a strong shock has been registered by the instruments of the Zikawei Observatory, a Seismological Bulletin will be issued immediately after the weather forecast at 0300, 0900, 1400, 1800 G.M.T. in the same code as for Eiffel Tower reports (International Code) giving the G.M.T. of the arrival of the P and S waves and followed by the distance and position of the epicentre according to the Zikawei data.

Ship Distress Signals.

TRANSMISSION OF DISTRESS SIGNALS: SUPPLEMENTARY INSTRUCTIONS.

The Distress Signal (SOS) may fail to arrest the attention of watchers when it is made at the normal rate of signalling

- (1) in congested areas,
- (2) at very long ranges on the high seas, and
- (3) when interference is experienced from atmospherics.

Experience indicates that the prolonged dashes (TTT), which are used when transmitting the Safety Signal laid down by the Safety of Life at Sea Convention, are distinctive even when heard in conjunction with other signalling, and if special stress is given to the three dashes (O) in the Distress Signal the difficulty experienced by watchers will be obviated or at least reduced.

The first signal (• • • — — — • • •) should therefore be transmitted for one minute at a rate of about five words per minute (equivalent to about eight repetitions of • • • — — — • • • per minute), special attention being given to the sending of long clear dashes.

The attention of operators is also called to the great importance of obtaining an absolute cessation of all other signalling in the region of the distress signal at the earliest possible moment. The greatest discretion and brevity should be used when repeating a distress call, or in asking or giving information regarding it.

DENMARK

The following Danish stations communicate with vessels in case of distress:

Station.	Call.	Lat.	Long.	Wave.
Graadby Light-vessel	OUX	55° 20' N.	8° 05' E.	600 sp.
Horns Rev Light-vessel	OUZ	55° 34' N.	7° 19' E.	600 sp.
Vyl Light-vessel	OUY	55° 22' N.	7° 41' E.	600 sp.
Skagens Rev Light-vessel	OUB	57° 46' N.	10° 44' E.	600 sp.
Læsø Trindel Light-vessel	OUT	57° 28' N.	11° 20' E.	600 sp.
Læsø Rende Light-vessel	OUK	57° 13' N.	10° 42' E.	600 sp.
Anholt-Knob Light-vessel	OUR	56° 46' N.	11° 52' E.	600 sp.
Gilleleje Flak N. Light-vessel	OUE	56° 10' N.	12° 18' E.	600 sp.
Gjedser Rev Light-vessel	OUU	54° 27' N.	12° 11' E.	300 sp.
Gjedser Havn	OXD	54° 32' N.	11° 56' E.	250 sp.

GERMANY

BROADCASTING OF DISTRESS SIGNALS.

Signals of distress are to be transmitted at a speed of about 10 words per minute, during the first minute, and repeated at the same speed when necessary.

In case of atmospheric disturbances being prevalent at the time of signalling, it is preferable to transmit at a greater speed, not to exceed 20 words per minute.

When the signals have to traverse a considerable distance, due either to the vessel being out of the regular track of shipping or to the nearest W.T. coast station being a long distance off, transmission should be reduced to a speed of 5 words a minute, taking particular care to make each dot and dash distinctly. This reduced speed is of course subject to there being no atmospheric disturbances rendering the signals liable to interruption.

GREAT BRITAIN

DISTRESS SIGNALS: BROADCASTING.

The British Government have recently had under consideration the question of improving the existing arrangements as regards the employment of wireless signals of distress by ships at sea.

A large number of ships equipped with W/T carry one experienced operator only, who usually keeps watch for a period of eight hours daily. During the remainder of the day, watch is kept by someone who is generally not skilful enough to distinguish W/T signals either when simultaneous emissions are taking place at different stations, or in the case of atmospheric disturbances. Even an experienced operator sometimes finds the latter difficult to contend with.

Instructions have therefore been issued to the effect that on board a vessel in distress the call SOS (• • • — — — • • •), and subsequent repetitions thereof, shall be transmitted at a speed equivalent to about five words per minute.

The same signal is also used by aircraft in distress or requiring assistance.

(In publishing this information the Bureau International de l'Union Télégraphique, Berne, states that it has also been adopted by the following countries:—

Norway, Mexico, Latvia, Sweden, Esthonia).

RECEPTION OF DISTRESS SIGNALS: PROCEDURE.

On receipt of a distress signal (SOS) all signalling is at once to cease and every effort made to assist the signal through to its destination.

If the distress signal is addressed to a particular station, and another station intercepting it finds that the station to which it is addressed has difficulty in dealing with it, the second station should do all in its power to give effect to the call.

Arrangements have been made with the General Post Office for advising Naval Authorities where distress signals are received by W/T stations belonging to the General Post Office.

The following stations deal with the reception and transmission of signals from vessels in distress locally:

Station.*	Call	Lat.	Long.	Wave.
Tongue Light-vessel	GVE	51° 30' N.	1° 23' E.	230
Gull Light-vessel	GVC	51° 16' N.	1° 29' E.	230
East Goodwin Light-vessel	GVB	51° 13' N.	1° 36' E.	230
South Goodwin Light-vessel	GVD	51° 09' N.	1° 28' E.	230
Cross Sand Light-vessel	GVA	52° 38' N.	1° 56' E.	230
Sunk Light-vessel	GVE	51° 52' N.	1° 37' E.	230

NEW ZEALAND.

The following stations maintain a continuous watch for distress signals:

Station.	Call.	Lat.	Long.	Wave.
Awamui	VLA	34° 54' S.	173° 18' E.	600
Awarua	VLB	40° 30' S.	168° 23' E.	600

UNITED STATES OF AMERICA.

VESSELS IN DISTRESS.

The United States Coast Guard Service is always ready to render any assistance to vessels in distress or to remove obstructions. The W/T stations given in the following schedule will transmit messages to the necessary authorities; or the master of the vessel may be able to communicate with one of the Coast Guard cutters either direct or through a U.S. Naval W/T station.

Should a master who has requested assistance find that his vessel is able to proceed with safety and does not require assistance, a message to that effect should be promptly sent.

SANDWICH (HAWAIIAN IS.), ALASKA & U.S. PACIFIC COAST.

The territories mentioned are divided into two divisions, viz.:—the Northern Division and the Southern Division.

The Southern Division extends from Cape Blanco, Oreg., to the Mexican border, and has its headquarters at San Francisco.

The Northern Division covers the remainder.

If the Coast Guard cutters cannot be communicated with direct, the messages should be transmitted to the nearest U.S. Naval W/T station.

UNITED STATES (GULF AND ATLANTIC COASTS)

Station	Call	Latitude Longitude	Wave	Notes
Key West, Fla. .	NAR	24° 33' N. 81° 48' W.	600 sp.	The Gulf Coast Guard Division, with headquarters at Key West, extends from Cape Canaveral to the Rio Grande. The W/T stations mentioned are available for vessels requiring assistance.
Jupiter, Fla. .	NAQ	26° 57' N. 80° 05' W.	600 sp.	
St. Augustine, Fla.	NAP	29° 53' N. 81° 17' W.	600 sp.	
Charleston, S.C.	NAO	32° 52' N. 79° 58' W.	600 sp.	The Norfolk Coast Guard Division, with headquarters at Norfolk. Vessels requiring assistance, passing derelicts or other obstructions between Lat. 38½° N. and 27° N., are requested to forward full information, including date, time, and the latitude and longitude of the position.
Morehead City, N.C.	NAN	34° 43' N. 76° 44' W.	600 sp.	
Norfolk, Va. .	NAM	36° 50' N. 76° 18' W.	600 sp.	
Hog I., Va. .	NCZ	37° 23' N. 75° 43' W.	800 sp.	} Sixth Coast Guard District.
Bethany Beach, Del.	NSD	38° 33' N. 75° 03' W.	800 sp.	
Cape Henlopen, Del.	NSD	38° 48' N. 75° 05' W.	800 sp.	
Cape May, N.J.	NSD	38° 56' N. 74° 55' W.	800 sp. 600 sp.	
New York . .	..	..	..
Newport, R.I.	NAF	41° 35' N. 71° 17' W.	600 sp.	} Eastern Coast Guard Division, with headquarters at Boston.
Boston, Mass.	NAD	42° 21' N. 70° 57' W.	600 sp.	
Bar Harbour, Me.	NBD	44° 14' N. 68° 18' W.	600 sp.	

Aircraft.

Information with regard to Distress Signals by Day and Night.

Mariners and others are notified that when any aircraft is in distress and requires assistance, the following shall be the signals displayed by her, either together or separately:—

- I. The International Signal "S.O.S." by means of visual or Wireless Telegraphy.
- II. The International Code Signal of Distress indicated by N.C.
- III. The Distant Signal, consisting of a square flag having above or below it a ball or anything resembling a ball.
- IV. A continuous sounding with any sound apparatus.
- V. A signal consisting of a succession of White Very's lights, fired at short intervals.
- VI. A white flare from which at intervals of about 3 seconds a white light is ejected into the air.

NOTE.—The above signals are subject to such modification as shall be published from time to time.

Wireless Navigational Warnings to Airmen.

Information of a specially urgent nature concerning aerial navigation e.g., warning regarding the discontinuation of navigational aids or obstruction of landing areas at aerodromes, will be broadcast by W/T from the Air Ministry Station (GFA), in addition to being promulgated in the usual manner. Such notices issued by W/T will be added at the end of the Air Ministry synoptic weather reports transmitted on a wavelength of 4,100 m. C.W. at any of the following times (G.M.T.) daily:—

0600, 0800, 1400, 1900.

Free Medical Advice to Seamen by W/T.

United States-Atlantic and Pacific Coasts.

Through the co-operation of the Seamen's Church Institute of New York with the United States Public Health Service, free medical advice for ships at sea is now available through the undermentioned coast W/T stations on the Atlantic and Pacific coasts of the United States, belonging to the Radio Corporation of America. The names of the hospitals furnishing the service are also designated:—

W/T Stations.	Call Signal.	Position. — Latitude. Longitude.	Hospitals.
Chatham, Mass. ..	WCC	41° 43' N. 70° 46' W.	U.S. Marine Hospital No. 70, 67, Hudson Street, New York. (Alternatively: Hospitals Nos. 38, 43 and 61.)
Siasconset, Mass. ..	WSC	41° 17' N. 69° 58' W.	
New York City ..	WNY	49° 39' N. 74° 00' W.	
Cape May, N.J. ..	WCY	38° 56' N. 74° 56' W.	U.S. Veterans' Hospital No. 49, Gray's Ferry Rd., and Twenty- fourth St., Philadelphia. (Alternatively: U.S. Veterans' Hospital No. 56, Baltimore.)
San Francisco (Bolinas)	KPHI	37° 54' N. 122° 42' W.	U.S. Marine Hospital No. 19, Fourteenth Avenue and Lake St., San Francisco. (Alternatively: U.S. Veterans' Hospital No. 24, Palo Alto, California.)

NOTE.—All stations use the 600 metre wave.

Ships desiring medical advice can secure prompt service by communicating with any of the above mentioned W/T stations. The message is to be signed by the master of the vessel, and should state briefly the symptoms of the person afflicted.

The reply containing the medical advice given by the hospital consulted will be sent in plain language (English) and so phrased as to be intelligible to a layman.

This free medical service has been established primarily for the benefit of ships not carrying physicians; however, should occasion arise, wireless consultation may be held by ships' physicians with the hospital staffs through the W/T stations referred to.

The United Fruit Co. has inaugurated a free medical radio service from its hospitals in the various countries of Central America, and from its passenger steamships to all ships at sea. This service is available without charge so far as the United Fruit Co. and subsidiary companies are concerned to ships of all nationalities through the following radio stations operated by the United Fruit Co., or the Tropical Radio Telegraph Co.:—

<i>Radio Stations</i>	<i>Call Letters</i>	<i>Wavelength.</i>
New Orleans, Louisiana	WNU	600
Burrwood, Louisiana	WBW	
Fort Morgan, Alabama	WIO	
Swan Island, Caribbean Sea	US	
Tela, Honduras	UC	
Puerto Castilla, Honduras	UA	
Tegucigalpa, Honduras	UG	
Port Limon, Costa Rica	UX	
Almirante, Panama	UB	
Santa Marta, Columbia	UJ	600 Reception. 2,200 Transmission.

Radiograms should be signed by the Captain of the ship and should state briefly but clearly the symptoms of the person afflicted. Such radiograms should be addressed "Unifruiteco" (name of place) and may be sent to any of the United Fruit Co.'s hospitals listed below:—

Santa Marta, Columbia.
Port Limon, Costa Rica.
Almirante, Panama.
Tela, Honduras.
Puerto Castilla, Honduras.
Puerto Barrios, Guatemala.

If the messages are sent to one of the United Fruit Company's Steamers, they should be addressed "Ship's doctor" followed by name of the steamer. All messages should be endorsed by the W/T operators: "(number of words) D.H. Medico."

"D.H. Medico" messages will be given preference over all other messages, excepting S O S calls, throughout the W/T service of the United Fruit Co., and its subsidiary companies.

This service is established primarily for the benefit of ships not carrying doctors; however, should occasion arise, ships' doctors may hold wireless consultation with the Company's ships' doctors and hospital staffs.

The physicians and surgeons comprising the medical staff of the United Fruit Co. and its subsidiaries are thoroughly qualified, but in view of the fact that the wireless medical advice to ships at sea is given free, and without an opportunity for a personal examination of the patients by them, no responsibility will be assumed by either the Company and its subsidiaries, or the physicians or surgeons giving the advice as to its accuracy, or for error in the receipt or transmission of any messages sent or received in connection therewith.

Medical Advice—contd.

Country and Station.	Call.	Wave-length.	
DENMARK			
Blaavand	OXB	600 sp.	Vessels at sea, whatever their nationality, may obtain medical advice by wireless free of charge in cases of sickness or accident on board, through Blaavand or Copenhagen W/T stations. The master of the vessel requiring advice should transmit to one of the stations mentioned a message (either in Danish, Norwegian, Swedish, German, English or French) giving a brief description of the symptoms or injuries. This will immediately be forwarded to the Communal Hospital, Esbjerg, or the Seamen's Hospital, Copenhagen, the doctors from which will despatch the necessary advice direct to the ship. All messages are transmitted free of charge.
Copenhagen	OXA	600 sp.	
SWEDEN			
Göteborg	SAB	600	Arrangements have been made, in co-operation with the Telegraph Department and the hospital authorities at Göteborg, whereby vessels at sea, of any nationality, may receive free medical advice in the event of sickness on board. The master of a vessel requiring such advice should transmit, in Swedish, English, French or German, a short message to Göteborg W/T station, describing the sickness, which will be forwarded by telegram to the Göteborg public hospital. The hospital will supply advice, which will be sent by wireless from the W/T station to the vessel in question. No charge will be made for this service.

Fog Signals.

A vessel equipped with a radio compass may determine its bearings from these stations, although they may not be visible, and may also obtain the bearing of another ship equipped with radio.

The track of a radio wave is approximately a great circle; in plotting bearings, therefore, taken at a considerable distance, on a chart of the Mercator projection, it must be remembered that the line of bearing is not a straight line excepting on the meridian.

In the case of submarine fog signals which are operated simultaneously with W/T fog signals, the distance of the ship from the light-vessel may be calculated approximately by observing the interval of time which elapses between the reception of these signals, either at the beginning or the end. This should be done by allowing 1,625 yards (1,486 metres) for each second that the submarine fog signal is heard after the W/T fog signal.

Country.	Call.	Wave-length.	Normal range.	Signals.	Period
CANADA					
Heath Point Lt. V. (8mi. 104° from Heath Point, Lat. 49° 03' 00" N. Long. 61° 30' 30" W.)	VCI	1,000 sp.	50 mi.	Groups of 4 dashes for Silent (The elapsed time from the beginning of one group of dashes to the beginning of the next group is 4 secs.) In foggy weather, the automatic transmitter will operate continuously. Spark frequency of signal = 500. This service is withdrawn during the winter months.	60 sec. 4 min
NEWFOUNDLAND					
Cape Ray Lat. 47° 37' 02" N. Long. 59° 18' 16" W.	—	1,000 sp.	50	Groups of 3 dashes for Silent Routine transmissions daily from 1400-1430 and from 2000-2030 G.M.T.)	60 sec 4 min

Country.	Call.	Wave-length.	Normal range.	Signals.	Period
FRANCE					
Ouessant (Créac'h Pt. Lighthouse) Lat. 48° 27' 36" N. Long. 5° 07' 48" W.	—	120	20	Signalling is effected by transmitting the musical note "C" one octave above middle "C" of the pianoforte (522 double-vibrations per sec.) 5 Groups of 3 dashes for Silent	15 sec. 30 sec.
Ile de Sein Lighthouse Lat. 48° 02' 34" N. Long. 4° 52' 00" W.	—	120	20	Signalling is effected by transmitting the musical note "G" one octave above the "G" next above middle "C" of the pianoforte (783 double vibrations per sec.) 10 Groups of 3 dots for.. Silent	13 sec. 27 sec.
NETHERLANDS					
Maas Lightvessel Lat. 52° 01' 39" N. Long. 3° 53' 52" E.	—	450	—	(a) W/T. Two dashes sent out every Particulars: Dash Silence Dash Silence (b) Submarine fog-bell Two strokes sent out every 20 secs. Particulars as for (a) above. NOTE.—Both the wireless and the submarine fog-signals, which it will be observed have similar characteristics and periods, operate simultaneously. By observing the interval of time which elapses between the reception of these signals, either at the beginning or the end, the distance of the ship from the light-vessel may be calculated approximately. This should be done by allowing 1,625 yards (1,486 m.) for each second that the submarine fog-signal is heard after the W/T fog-signal	20 sec. 3 sec. 1 sec. 3 sec. 13 sec.
NORWAY (South Coast)					
Lille Færder Lighthouse (Christiania Fjord Entrance) Lat. 59° 01' 36" N. Long. 10° 31' 54" E.	TRW	1,000	30	TRW, TRW, TRW, then VVV repeated for .. TRW, TRW, TRW, then VVV repeated for .. TRW, TRW, TRW, silence	50 sec. 50 sec. 60 sec.
NORWAY (West Coast)					
Marsten Lighthouse Lat. 60° 07' 50" N. Long. 05° 01' 08" E.	TSY	1,000	30	(Procedure as for Lille Færder Lighthouse above, except for call sign). The above signals are transmitted automatically and are operated continuously during bad visibility and when the sound fog signals are in use	
SPAIN (N.W. Coast)					
Cape Finisterre Light-house Lat. 42° 52' 55" N. Long. 9° 16' 18" W.	EAF	1,000	30	A note tuned to 500 vibrations per sec. of 0.5 sec. duration every 7½ sec. Sound for Silent (i.e., 8 emissions per minute).	½ sec. 7 sec.
Cape Villano Lighthouse Lat. 43° 10' N. Long. 9° 13' W.	—	1,000	30	A group of sounds tuned to 600 vibrations per sec. every 30 secs. Particulars: A dash for.. .. . Silent A dash for.. .. . Silent	1 sec. 7 sec. 1 sec. 21 sec.

Country.	Call.	Wave-length.	Normal Range.	Signals.	Period.
GREAT BRITAIN					
Inchkeith (Firth of Forth) Lat. 56° 02' 11" N. Long. 3° 08' 09" W.	— —	4½ to 6	10 —	Wireless fog signal (experimental). Signalling is effected by means of a wireless transmitter and wireless reflector, the whole apparatus revolving so as to enable a ship to fix her position by bearing when within a 10 miles radius. The reflector makes a complete revolution once every two minutes, and a distinctive signal is sent for every half-point of the compass. This should enable the bearing of the transmitter to be determined within a quarter-point of the compass. The exact time of the maximum signal is not easy to determine by ear, but the times of starting and vanishing are easy to determine, as the rate of rise and fall of the signals is extremely rapid. The mean of these times gives the exact bearing of the ship in relation to the transmitting station.	

Diagram of distinctive
Signals sent by the
Inchkeith Reflector.



RADIO FOG SIGNALS OF THE UNITED STATES LIGHTHOUSE SERVICE.

These signals are operated *continuously* during thick or foggy weather and at intervals during clear weather, as indicated. The normal range of these signals for direction finding purposes is from 30 to 50 miles. All stations operate on 1,000 meter wave. Submarine bells are maintained on all the light vessels listed and they are operated independently of the radio signals.

Station.	Latitude. Longitude.	Call Letters.	Characteristic.	Hours of Service, Clear Weather, G.M.T.
Boston Light-vessel, Mass	42° 20' 22" N. 70° 45' 26" W.	None	Groups of 1 dash and 1 dot for 15 sec. Silent 15 sec.	None
Nantucket Shoals Light-vessel, Mass.	40° 37' 02" N. 69° 37' 06" W.	NLA	Groups of 4 dashes for .. 30 sec. Silent 25 sec.	See footnote
Fire Island Light-vessel, N.Y.	40° 28' 40" N. 73° 11' 26" W.	NLS	Groups of 2 dashes for .. 25 sec. Silent 25 sec.	Daily, 1400-1430 2000-2030
Ambrose Channel Light-vessel, N.Y.	40° 27' 59" N. 73° 50' 02" W.	NALS	Single dashes for .. 20 sec. Silent 20 sec.	Daily, 1400-1430 2000-2030

Station.	Latitude. Longitude.	Call Letters.	Characteristic.	Hours of Serv Clear Weath G.M.T.
Sea Girt Light Station, N.J.	40° 08' 12" N. 74° 01' 40" W.	None	Groups of 3 dashes for .. 30 sec. Silent .. 3 min.	Daily, 1400- 2000-
Cape Henry Light Station, Va.	36° 55' 35" N. 76° 00' 27" W.	None	Groups of 2 dots and 1 dash for 20 sec. Silent .. 15 sec.	None
Diamond Shoal Light-vessel, N.C.	35° 05' 18" N. 75° 19' 44" W.	NITQ	Groups of 2 dashes for .. 30 sec. Silent .. 30 sec.	Daily, 1400- 2000-
Columbia River Light-vessel, Oregon	46° 10' 45" N. 126° 10' 35" W.	NAJT	Groups of 3 dashes for .. 20 sec. Silent .. 20 sec.	On request
Blunts Reef Light-vessel, Calif.	40° 26' 04" N. 124° 30' 14" W.	NACT	Single dashes for .. 30 sec. Silent .. 35 sec.	On request
San Francisco Light-vessel, Calif.	37° 45' 03" N. 122° 41' 30" W.	NAKS	Groups of 2 dashes for .. 30 sec. Silent .. 30 sec.	On request

NOTE: (1) Nantucket Shoals Light-vessel radio fog signal will operate daily in clear weather for the first 15 minutes of each hour from 11 p.m. to 7 a.m., Eastern Standard Time (0400-1200) G.M.T., and on request. Oper- stands watch on 600 metres first 15 minutes of each hour from 8 a.m. to 10 p.m. Eastern Standard Time (1300-0 G.M.T. for answering requests from vessels desiring to have the radio fog signal operated.

This system is the reverse of that used in the United States Navy.

(2) Boston Light-vessel, Sea Girt Light Station and Cape Henry Light Station have no call letters, the auto- radio fog signal being the only radio equipment maintained.

(3) In addition to the radio fog signal stations, the following named light-vessels maintain radio service for purpose of answering or relaying distress or emergency messages. Watch is maintained on these vessels for the 15 minutes of each hour from 8 a.m. to 5 p.m. local time.

Station.	Latitude. Longitude.	Call Letters.
Cornfield Point, Conn.	41° 12' 56" N. 72° 22' 15" W.	NASC
Northeast End, N.J.	38° 57' 45" N. 74° 29' 34" W.	NARS
Five Fathom Bank, N.J.	38° 47' 16" N. 74° 34' 33" W.	NADV
Fenwick Island Shoal, Del.	38° 25' 10" N. 74° 45' 52" W.	NAJS
Winter Quarter Shoal, Va.	37° 55' 25" N. 74° 56' 22" W.	NADT
Cape Charles, Va.	37° 04' 55" N. 75° 41' 00" W.	NAJV
Cape Lookout Shoals, N.C.	34° 18' 27" N. 76° 24' 18" W.	NABV
Frying Pan Shoals, N.C.	33° 34' 04" N. 77° 48' 49" W.	NLC
Heald Bank, Tex.	29° 06' 05" N. 94° 12' 27" W.	NLP
Swiftsure Bank, Wash.	48° 31' 44" N. 125° 00' 00" W.	NABT
Umatilla Reef, Wash.	48° 10' 03" N. 124° 50' 25" W.	NACV

THE MORSE CODE

Two forms of Morse Code are in use, the "Continental Morse Code," and the "American Morse Code." The latter is now only officially recognised for use in land line telegraphs in America, so that the Continental Code is used universally in Radio work.

Continental Morse is a dot and dash system, every letter or symbol consisting of a combination of these. Considering as an element either a dot or a dash, no ordinary unaccented letter is represented by more than four elements. Some punctuation signs, numerals and whole words are represented by more than four elements.

Rules for formation of Continental Morse code :

These rules apply irrespective of the speed of transmission.

(1) The time occupied by a dash should be equal to that occupied by three dots.

(2) The time occupied by the interval between two elements of one letter or other symbol should be equal to the time occupied by one dot.

(3) The interval between two letters in a word should be equal to the time occupied by three dots.

(4) The interval between two words should be equal to the time occupied by five dots.

Letters.

CONTINENTAL MORSE.

a	• —	m	— —
ä	• — • —	n	— •
á } â }	• — — • —	ñ	— — • — —
b	— • • •	o	— — —
c	— • — •	ö	— — — •
ch	— — — —	p	• — — •
d	— • •	q	— — • —
e	•	r	• — •
é	• • — • •	s	• • •
f	• • — •	t	—
g	— — •	u	• • —
h	• • • •	ü	• • — —
i	• •	v	• • • —
j	• — — —	w	• — —
k	— • —	x	— • • —
l	• — • •	y	— • — —
		z	— — • •

Figures.

CONTINENTAL MORSE.

1	• — — — —	6	— • • • •
2	• • — — —	7	— — • • •
3	• • • — —	8	— — — • •
4	• • • • —	9	— — — — •
5	• • • • •	0	— — — — —

Abbreviated Continental Morse Figures.

1	• —	6	— • • • •
2	• • —	7	— • • •
3	• • • —	8	— • •
4	• • • • —	9	— •
5	• • • • •	0	—

Punctuation and Other Signs.

CONTINENTAL MORSE.

Full stop	.. .. .	(.)	• • • • •
Semicolon	.. .. .	(;)	— • — • — •
Colon	.. .. .	(:)	— — — • •
Comma	.. .. .	(,)	• — • — • —
Note of interrogation, or, request for a repetition	.. .. .		• • — — • •
Note of exclamation	.. .. .	(!)	— — • — —
Apostrophe	.. .. .	(')	• — — — •
Hyphen or dash	.. .. .	(-)	— • • • • —
Fractional bar	.. .. .	(/)	— • • — •
Brackets. <i>This sign must be made both before and after the words which are to be bracketed</i>		()	— • — — • —
Inverted commas. <i>Must be made before and after the words which are to be quoted</i>	.. .. .	(" ")	• — • • — •
Underline. <i>Must be made before and after words which are to be underlined</i>	.. .. .		• • — — • —
Preliminary call. <i>To precede every transmission</i>	.. .. .		— • — • —
Double dash. <i>Generally called the "break sign." The signal separating preamble from address, address from text and text from signature</i>	.. .. .	(=)	— • • • —
End of message	.. .. .		• — • — •
Error. <i>Means, "Erase." Some operators, however, use the repetition signal</i>	.. .. .		• • • • •
Invitation to transmit	.. .. .		— • —
Wait	.. .. .	(AS)	• — • • •
"Received" signal	.. .. .		• — •
Distress call. <i>Formerly CQD</i>	.. .. .	(SOS)	• • • — — • •
"All stations"	.. .. .	(CQ)	— • — • — — • —
End of Work	.. .. .	(SK)	• • • — • —

Punctuation and Other Signs.

AMERICAN MORSE.

Full stop	..	..	..	..	..	(.)	• • — — • •
Semicolon	..	..	..	..	..	(:)	• • • • •
Colon	..	..	..	..	..	(:)	— • — • •
Comma	..	..	..	..	..	(,)	• — • —
Note of interrogation	..	..	..	..	..	(?)	— • • — •
Note of exclamation	..	..	..	..	..	(!)	— — — •
Apostrophe	..	..	..	..	..	(')	• • — • • — • •
Hyphen	..	..	..	..	..	(-)	• • • • • — • •
Dash	..	..	..	..	..	(—)	— • • • — • •
Fractional bar	..	..	..	..	..	(/)	•
Bracket (begin)	..	..	..	..	..	( ( )	• • • • • — •
Bracket (end)	..	..	..	..	..	( ) )	• • • • • • • • •
Inverted commas (begin)	..	..	..	..	..	(“)	• • — • — •
Inverted commas (end)	..	..	..	..	..	(”)	• • — • — • — •
Underline (begin)	..	..	..	..	..		• • — • — • •
Underline (end)	..	..	..	..	..		• • — — • — •
Dollars	..	..	..	..	..	(\$)	• • • • • — • •
Pounds (sterling)	..	..	..	..	..	(£)	• • • • • • — • •
Capital Letter	..	..	..	..	..		• • • • • — • •
Decimal point	..	..	..	..	..	(DOT)	— • • • • —
Paragraph	..	..	..	..	..	(¶)	— — — —
Per cent.	..	..	..	..	..		— — • — —
&		• • • •

The following are extracted from the International Convention on Safety of Life at Sea :—

ARTICLE II.

SAFETY SIGNAL.

The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power :

— — — (T T T)

In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress.

The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes.

The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character.

When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

ARTICLE III.

MORSE CODE.

INTERNATIONAL SIGNALS.

These signals may be made at night or in thick weather, either by long and short flashes of light, or by long and short sound signals (whistles, fog-horns, etc.), or during the day by hand flags.

1.—URGENT AND IMPORTANT SIGNALS.

You are standing into danger..	..	..	• • —
I want assistance : remain by me	..	..	• • • —
Have encountered ice	..	..	• — —
Your lights are out (<i>or</i> , burning badly)	..		• — — •
The way is off my ship ; you may feel your way past me	..	..	• — •
Stop (<i>or</i> , heave to) ; I have something important to communicate	..	..	• — • •
Am disabled ; communicate with me	..		• • — •

2.—GENERAL SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.	How Answered.
Preparative ..	• • • • • &c.	A succession of E's in one group	By the general answer T.
Answer	—	T (singly)	
Spelling	• • — • • • — •	F F in one group	By the general answer T.
Use International Code of Signals	— — — — —	M M M in one group	By the general answer T.
International Code Flag sign	— — — —	M M in one group	
Break sign	• • • •	I I as separate letters	
Stop	• • • • •	I I I as separate letters	
Finish of the message	• • • — •	V E as one group	• — • R. — • • D. As separate letters.
Erase sign	• • • • &c.	A succession of E's as separate letters	By a succession of E's as separate letters.
Annul	W W • — — • — —	W W as one group	By W W as one group.
Repeat word after : (when a single word is required)	I M I • • — — • • W A • — — • — — Followed by the word preceding the one required	I M I as one group W A as separate letters	By the general answer T.
Repeat all after : (if more than one word is required)	I M I • • — — • • A A • — — • — —	I M I as one group A A as separate letters	By the general answer T.
Repeat all : (if the whole message is to be repeated)	I M I • • — — • • A L L • — — • — —	I M I as one group A L L as separate letters	By the general answer T.

3.—NATIONALITY SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.
American	— • — • — • •	C D as separate letters.
Argentine	— — — • — • — •	C G " "
Austro-Hungarian	— — — • — • — •	C F " "
Belgian	— • — • — • — •	D C " "
Brazilian	— • — • — • — •	D E " "
British	• — • — • — • —	F.
Bulgarian W	— • — • — • — •	D F as separate letters.
Chilian	— • — • — • — •	D G " "
Chinese	• — • — • — • —	E C " "
Colombian	• — • — • — • —	E D " "
Danish	• — • — • — • —	E F " "
Dutch	• — • — • — • —	E G " "
French	• — • — • — • —	E.
German	— — — • — • — •	G.
Greek	— — — • — • — •	M M in one group followed by D.
Italian	— • — • — • — •	C E as separate letters.
Japanese	— • — • — • — •	C.
Mexican	• — • — • — • —	F C as separate letters.
Norwegian	— — — • — • — •	M M in one group followed by C.
Peruvian	• — • — • — • —	F D as separate letters.
Portuguese	• — • — • — • —	F E " "
Russian	— • — • — • — •	D.
Siamese	• — • — • — • —	F G as separate letters.
Spanish	— • — • — • — •	G C " "
Swedish	— • — • — • — •	M M in one group followed by E.
Turkish	— • — • — • — •	G D as separate letters
Uruguayan	— • — • — • — •	G E " "
Venezuelan	— • — • — • — •	G F " "

4.—INSTRUCTIONS.

1. THE URGENT AND IMPORTANT SIGNALS may be made without the Preparative Signal being answered if it is supposed that the person addressed cannot reply, or in other special circumstances; but in this case a pause should be made between the Preparative Signal and the message.

2. THE SIGNAL • • — • • • — • (FF) is used previous to any letters which are intended to spell words.

3. THE SIGNAL — — — — — (MMM) is used previous to any messages sent by means of the International Code of Signals.

4. THE SIGNAL — — — — — (MM) means the Code Flag of the International Code of Signals, and is used as indicated in the Code Book.

5. THE BREAK SIGN is used between the address of the receiver and the text of the message, and after the message if the name of the sender is to be signalled.

6. THE STOP is used, where necessary, in the text of the signal.

7. THE ERASE is used to cancel the last word or signal group, sent by mistake.

8. THE ANNUL is used to cancel *all* the message.

9. METHOD OF ANSWERING. Each word or signal group when understood, is to be answered by one long flash — (T).

If a word or signal group is not answered, the sender is to repeat it until answered by a long flash.

At the end of the message, if understood, the receiver will make • — • — • • (RD).

The Erase and Annul signals are to be answered by their own signs

10. THE NATIONALITY SIGNAL is made immediately after the answer to the Preparatory Signal has been received, to indicate the nationality of the vessel making the signal. It is answered by the nationality signal of the vessel receiving the message.

The following are extracted from the International Radiotelegraphic Convention.

APPENDIX.

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS.

Abbrevia- tion. 1.	Question. 2.	Answer or Advice. 3.
— • — • — • — (CQ)	.. .. .	Inquiry signal employed by a station which desires to correspond.
— • — • (TR)	.. .. .	Signal announcing the sending of indications concerning a ship station (Article XXVIII).
— — • • — — (I)	.. .. .	Signal indicating that a station is about to send with high power.
PRB	Do you wish to communicate with my station by means of the International Signal Code?	I wish to communicate with your station by means of International Signal Code.
QRA	What is the name of your station?	This station is.....
QRB	How far are you from my station?	The distance between our station is..... nautical miles.
QRC	What are your true bearings?	My true bearings are.....degrees.
QRD	Where are you bound?	I am bound for.....
QRF	Where are you coming from?	I am coming from.....
QRG	To what company or line of navigation do you belong?	I belong to.....
QRH	What is your wavelength?	My wavelength is.....metres.
QRJ	How many words have you to transmit?	I have.....words to transmit
QRK	How are you receiving?	I am receiving well.
QRL	Are you receiving badly? Shall I transmit 20 times • • • — • so that you can adjust your apparatus	I am receiving badly. Transmit 20 times • • • — • so that I can adjust apparatus.
QRM	Are you disturbed?	I am disturbed.
QRN	Are the atmospheric very strong?	The atmospheric are very strong.
QRO	Shall I increase my power?	Increase your power.
QRP	Shall I decrease my power?	Decrease your power.
QRQ	Shall I transmit faster?	Transmit faster.
QRS	Shall I transmit more slowly?	Transmit more slowly.
QRT	Shall I stop transmitting?	Stop transmitting.
QRU	—	I have nothing to transmit.
QRV	Are you ready?	I have nothing for you.
QRW	Are you busy?	I am ready. All is in order.
QRX	Shall I wait?	I am busy with another station (or with please do not interrupt).
QRY	What is my turn?	Wait. I will call you at.....o'clock (or when I want you).
QRZ	Are my signals weak?	Your turn is No.
QSA	Are my signals strong?	Your signals are weak.
QSB	Is my tone bad?	Your signals are strong.
QSC	Is my spark bad?	The tone is bad.
QSD	Is the spacing bad?	The spark is bad.
QSF	Let us compare watches. My time is What is your time?	The spacing is bad.
QSG	Are the radiotelegrams to be transmitted alternately or in series?	The time is.....
QSH	—	Transmission will be in alternate order.
QSI	—	Transmission will be in series of five radiotelegrams.
QSK	What is the charge to collect for.....?	Transmission will be in series of ten radiotelegrams.
QSL	Is the last radiotelegram cancelled?	The charge to collect is.....
QSM	Have you got the receipt?	The last radiotelegram is cancelled.
QSN	What is your true course?	Please give a receipt.
QSO	Are you communicating with land?	My true course is.....degrees.
QSP	Are you in communication with another station (or with.....)?	I am not communicating with land.
	Shall I signal to that you are calling him?	I am in communication with (through the medium of.....).
		Inform that I am calling him.

Abbrevia- tion. 1.	Question. 2.	Answer or Advice. 3.
QSO	Am I being called by.....? ..	You are being called by.....
QSR	Will you dispatch the radiotelegram? ..	I will forward the radiotelegram.
QST	Have you received a general call? ..	General call to all stations.
QSU	Please call me when you have finished (or at.....o'clock)	I will call you when I have finished.
QSV	Is public correspondence engaged? ..	Public correspondence is engaged. Please do not interrupt.
QSW	May I increase the frequency of my spark?	Increase the frequency of your spark.
QSX	Must I diminish the frequency of my spark?	Diminish the frequency of your spark.
QSY	Shall I transmit with a wavelength of.....metres?	Let us transfer to the wavelength of.... metres.
QSZ	.. .. .	Transmit each word twice. I have diffi- culty in receiving your signals.
QTA	.. .. .	Transmit each radiotelegram twice. I have difficulty in reading your signals, or
QTB	.. .. .	Repeat the radiotelegram you have just sent. Reception doubtful.
QTC	Have you anything to transmit? ..	Number of words not agreed; I will repeat first letter of each word and first figure of each group.
		I have something to transmit.
		I have one (or several) radiotelegrams for

When an abbreviation is followed by a mark of interrogation it applies to the question indicated in respect of that abbreviation.

In addition to these signals, which, it will be observed, are uniform in construction, the following signals of the International Telegraph Code may be used in these communications:—

- • — • • "Repeat" sign (as well as mark of interrogation).
- • • — • Understood.
- — • • • Wait.

EXAMPLES.

Station.						
A	•	QRA?	..	..	..	What is the name of your station?
B		QRA	Campania	..	..	This is the Campanian.
A		QRG?	..	..	..	To what company or line of navigation do you belong?
B		QRG	Cunard. QRZ	..	..	I belong to the Cunard Line. Your signals are weak.
Station A then increases the power of its transmitter and sends:—						
A		QRK?	..	..	..	How are you receiving?
B		QRK	..	..	..	I am receiving well.
		QRB	80°	..	..	The distance between our stations is 80 nautical miles.
		QRC	62	..	..	My true bearings are 62 degrees, etc.

SPECIAL ARTICLES SECTION

- (1) Recent Experiments on Atmospherics.
- (2) Dull Emitter Valves.
- (3) The Ideal Empire Wireless Chain.
- (4) Progress in Wireless Telegraphy in the
British Mercantile Marine during
1923.
- (5) Some Polar Diagrams of Reception for
Systems of Spaced Aerials.

RECENT EXPERIMENTS ON ATMOSPHERICS

By E. V. APPLETON, M.A., D.Sc.

THE subject of atmospherics really belongs to the border-line between the subjects of Wireless Telegraphy and Atmospheric Electricity and we are indebted to workers in both of these sciences for our present knowledge of these naturally occurring waves. The information contributed by the observers in radiotelegraphy dates from very early days. In 1912 the first set of organised experiments was described by Eccles and Airey who found that the same atmospherics could be identified simultaneously in Newcastle and London. In these experiments an attempt was made to estimate the intensity of the atmospherics aurally, and it was found that the London and Newcastle log-books agreed approximately as to the relative magnitude of particular atmospherics. These results quite definitely proved that the source of atmospherics was at a distance large compared with the distance between the two observing stations.

The method of aural observation used by Eccles and Airey is obviously not capable of very great accuracy and during the years 1919-1922 I worked at the problem of developing more accurate methods of measuring the intensity of atmospherics. Two methods were found to give fairly satisfactory results. In the first method the rectified quantity of electricity produced in a wireless detector circuit by an atmospheric was measured. The circuit used for these measurements is shown diagrammatically in Fig. 1. This is seen to be an ordinary tuned aerial circuit with crystal detector, D.

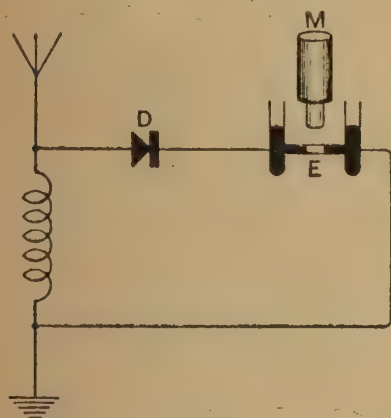


Fig. 1.

proportional to the quantity of electricity passing through the electrometer. Thus with such an electrometer, the small rectified quantity of electricity caused by an atmospheric is proportional to the displacement of the mercury meniscus as seen through the microscope M.

In the second method an attempt was made to detect the transient potentials developed in an antenna system by means of a small cathode ray tube. The apparatus is shown diagrammatically in Fig. 2, where the cathode-ray or electron tube, T, is shown placed between the two aerial plates, P_1P_2 .

In the absence of any transient potential difference in the aerial, the electrons emitted by the filament F, reach the anode A, and a steady current is registered in the ballistic galvanometer G. A transient potential difference between the plates P_1P_2 , however, deflects the electrons almost instantaneously so that some of them do not reach the anode

The small quantity of electricity passing through the detector when an atmospheric was incident on the aerial, was measured by the capillary electrometer E. This electrometer consisted of a small bubble of dilute sulphuric acid enclosed between two columns of mercury. The movement of such a bubble has been shown by Mr. C. T. R. Wilson to be

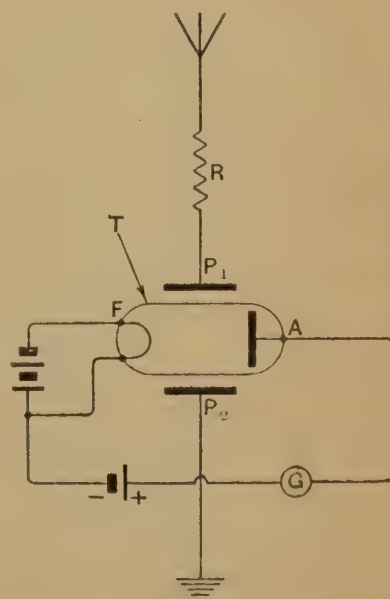


Fig. 2.

and the current through G is temporarily reduced. The sudden reduction of the current through G , may be taken as an indication of the peak potential developed between the aerial plates by an atmospheric.

This arrangement was not found to be as sensitive as the circuit of Fig. 1, but with it I was able to detect and measure relatively the atmospherics originating from local thunderstorms. The apparatus was also of interest in that its deficiencies pointed the way in which the problem of the determination of the wave-form of an atmospheric might be attacked. The apparatus shown in Fig. 2 was useless for such determinations (a) because it was not sensitive enough and (b) because the rapid alteration of current in G , even if recorded by some rapidly acting galvanometer (*e.g.*, of Einthoven type), was independent of the sign of the deflecting potential. The obvious solution was to put the deflecting plates inside the tube and thus nearer the electronic beam and observe the motion of the fluorescent spot caused by the impact of more swiftly moving electrons on a sensitive screen. While working at the development of such a tube the Western Electric Company placed on the market a cathode-ray oscillograph which satisfied the requirements and the writer collaborated with Mr. Watson Watt (who had been working on almost identical lines at the same problem) in using one of these new tubes for the experimental determination of the wave-form,

intensity and duration of atmospherics. We were enabled to carry out this experiment by the facilities provided by the Radio Research Board, who allowed their experimental station at Aldershot to be used for this purpose.

The essential features of the apparatus finally used is shown in Fig. 3. A condenser C , included in an aperiodic aerial circuit is connected by means of a linear and aperiodic triode ampli-

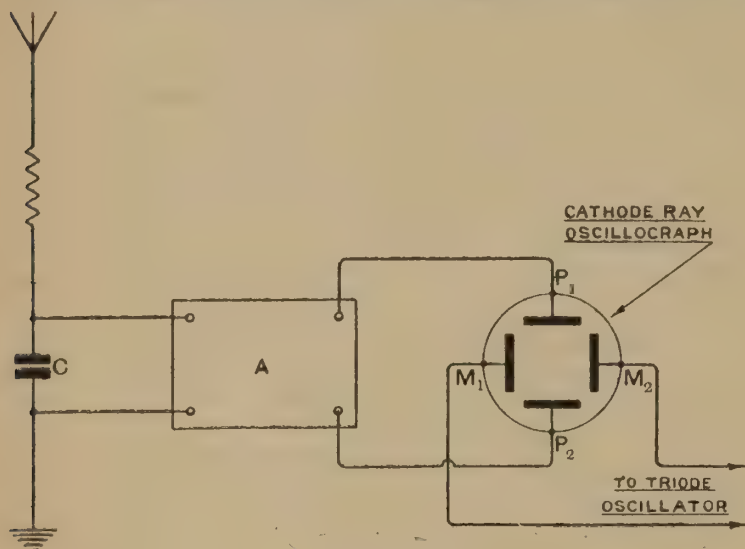


Fig. 3.

fier to the two deflecting plates P_1P_2 of the cathode-ray oscillograph. Transient potentials developed by an atmospheric cause a vertical movement of the electronic beam and, if this beam is caused to move to and fro horizontally with a suitable frequency by means of an alternating potential applied to the plates M_1M_2 , the picture of the wave-form of atmospheric is shown on the screen. The picture is of course transient but, due to the afterglow of the oscillograph screen, its shape may be determined with some certainty. Some typical wave-forms are shown in Fig. 4.

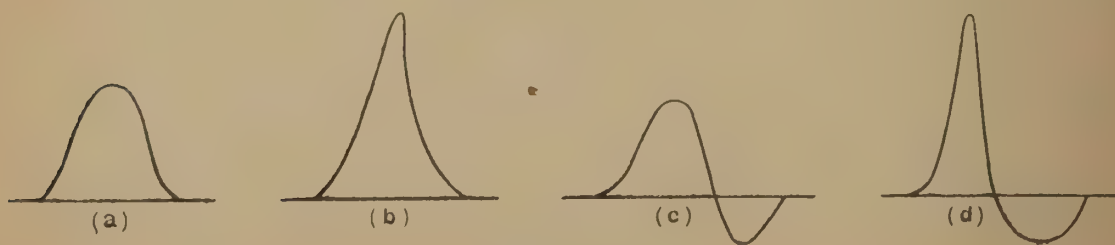


Fig. 4.

The atmospherics examined were found to be usually entirely aperiodic (Fig. 4, (a) and (b)), or to be quasi-periodic (Fig. 4, (c) and (d)). The duration of atmospherics is normally of the order of $1/500$ of a second. The intensity of the field disturbances is enormous, being usually of the order of 0.1 volt per metre. A lot of the atmospherics examined were found to consist of an aperiodic pulse on which was superposed a higher-frequency ripple. As the corresponding wavelengths of these ripples may sometimes be as low as 10,000 metres, it is obvious that such atmospherics may produce a pronounced effect in a wireless receiver tuned to neighbouring wavelengths.

The experiments described immediately above are still in progress, and from them we hope to obtain considerably more information regarding the seasonal variation of atmospherics.

The origin of atmospherics has been the subject of much speculation since the early days of wireless telegraphy. It has become a commonplace, since the time of Tesla's early experiments, that thunderstorms are the origin of many violent atmospherics, but it is only within the last ten years that exact data regarding the electrical magnitudes of lightning flashes have become available. We are indebted to Mr. C. T. R. Wilson for this precise information. He has shown that the average quantity of electricity brought to earth in a lightning flash is of the order of 20 coulombs and that the length of a lightning flash is usually of the order of two or three kilometres. Three years ago I discussed* the significance of these determinations from a wireless point of view pointing out that Mr. Wilson's figures indicated that we must regard a lightning flash as an aerial two or three kilometres in height with an aerial current of at least 10,000 amperes. It is thus obvious that a lightning flash must cause an intense radiation field within a radius of thousands of miles from its origin and is thus quite capable of producing the effects usually associated with atmospherics.

Within the last few years much work has been done on the determination of the apparent direction of arrival of atmospherics by Hoyt-Taylor and Watson Watt using coil direction-finders. Hoyt-Taylor has shown that the apparent direction of maximum atmospheric disturbance varies during the day, a result confirmed by much more precise and exhaustive experiments carried out by Watson Watt. These variations, I think, may possibly be explained in terms of the diurnal variation of thunderstorm frequency in Africa and South America if the diurnal change of wave attenuation due to atmospheric absorption is also taken into account. But the experimental fact remains that a loop aerial does indicate directions of maximum and minimum intensity and most of the anti-Atmospheric schemes that have proved successful are due to their recognition of this directional effect.

* Yearbook of Wireless Telegraphy and Telephony, p. 1114, 1921.

DULL EMITTER VALVES

By CAPT. C. F. TRIPPE, A.M.I.E.E.

LOW temperature valves, or those in which the necessary electronic emission is obtained from a thoriated tungsten filament running at a temperature much below that of an ordinary valve, first made their appearance in England in 1920, when the General Electric Co. produced a valve which they designated "L.T.1," having the general characteristics of the R valve, while requiring only 0.61 watts (0.36 ampere at 1.7 volts) for filament heating, as compared with 2.8 watts in the former type.

This valve, now known in its modified form as type D.E.R. was the forerunner of later types in which the filament current has been still further reduced, in some cases, to as low a value as 60 milliamperes, thus bringing about the practical possibility of employing dry cells for filament heating, and thereby removing what has hitherto been the one great objection to domestic wireless apparatus, the use of accumulators.

All the English valve makers are now producing low temperature valves of one kind or another, so that there is every prospect of this type being developed to such an extent as will, in the near future, enable them to be readily obtained at such a reasonable price that, in consideration of their obvious advantages, they may be expected to ultimately entirely supersede the older types.

While English practice has been to procure low temperature emission from filaments of thoriated tungsten wire, other countries, notably America, have, to a considerable extent, arrived at similar results with platinum filaments coated with certain oxides having low temperature emitting qualities. This latter type has now been developed by certain manufacturers in this country, and the relative advantages which one type may possess over the other will largely depend on the individual user and his own particular requirements.

So far, the main advantage which the thoriated tungsten type possesses lies in the exceptionally low current at which its filament can be run while producing an emission of 6 to 8 milliamperes, and which, without doubt, renders it a practical dry battery valve.

Its low filament current of 0.06 ampere is well within the limits of ordinary dry batteries, while its voltage—2.4 to 3 volts—renders it suitable for running from three such cells in series.

As, however, receiving sets are usually fitted with more than one valve, the battery life which would be obtained when running two, three, or even four in parallel, must be considered. The current values would then be 0.06, 0.12, 0.18 or 0.24 ampere, and reference to the battery life curves here shown will indicate how long, ordinary dry cells would be expected to last when discharging at these rates. (See Fig. 1).

It will be seen that as many as three valves can be run from one battery—three cells in series—and produce a reasonable battery life, and that this can be increased to four with fairly practical results, although the hours life then obtained is very considerably reduced. The cells are considered as having reached the end of their useful life when their voltage has fallen to about 0.8 volt.

In considering these curves, it must be pointed out that they represent voltage decrease when discharging through a resistance load for comparatively long periods, so that some improvement would be expected if the discharge were confined to, say, three or four hours per day. This improvement will be greater at the higher current rates of discharge than at the lower.

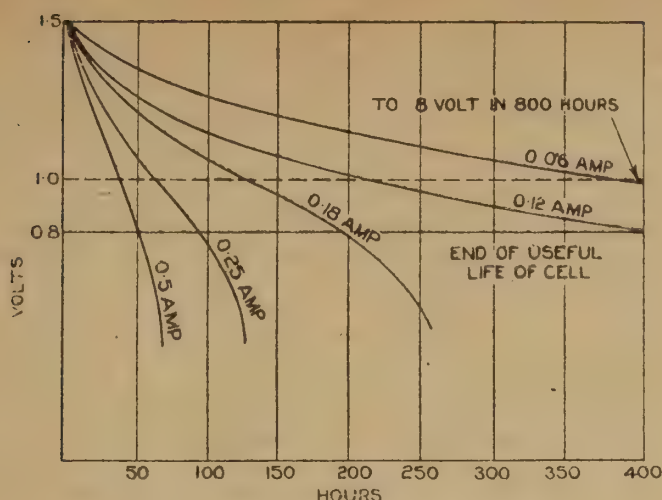


Fig. 1. Battery Life Curves.

The coated filament type of valve has a filament current rating of 0.25 ampere at 0.8 to 1 volt, so that on the basis of the above battery life curves, a minimum of three cells, preferably four, connected in parallel, would appear to be required to run one, two or three valves. The makers, however, claim that one of their special dry cells is capable of running a single valve for several weeks.

Regarding operating characteristics, the new valves show improvement in this respect also, particularly in their lower impedance, which is of the average order of 20,000 as compared with 30,000 or 40,000 for the previous types. The operating anode voltages can therefore be considerably lower.

Available types of low temperature valves which can now be obtained from English makers may be generally summed up as follows:—

Type.	Filament.		Total Emission.	Average Impedance.	Operating Anode Voltage.
	Volts.	Current.			
1	1.6—1.8	.35 amp	5—6 m.a.	32,000	30—50
2	1.6—1.8	.24 "	5—6 "	35,000	30—50
3	0.8—1.0	.25 "	3—5 "	20,000	20—40
4	2.4—3.0	.06 "	5—7 "	20,000	20—40

To refer briefly to the manufacturing side of low temperature valves, it may be said that both types obtain their emission from materials which have long been known to possess the faculty of producing very much greater emission for a given temperature than tungsten, as was used in ordinary valves.

In the case of the coated filament type, the particular materials form a coating on a suitable wire which is run at a temperature sufficient to produce the required emission, this coating being applied to the wire itself before mounting in the valve.

In the thoriated tungsten type, the manufacturing process is quite different.

It has long been known that the emission from thorium is many times greater than that from tungsten at the same temperature, but as it is not easily possible to make a thorium wire, methods had to be evolved whereby the thorium could be incorporated in the tungsten wire, and so distributed in the finished valve that thorium emission would be obtained at a temperature which would be too low to produce tungsten emission.

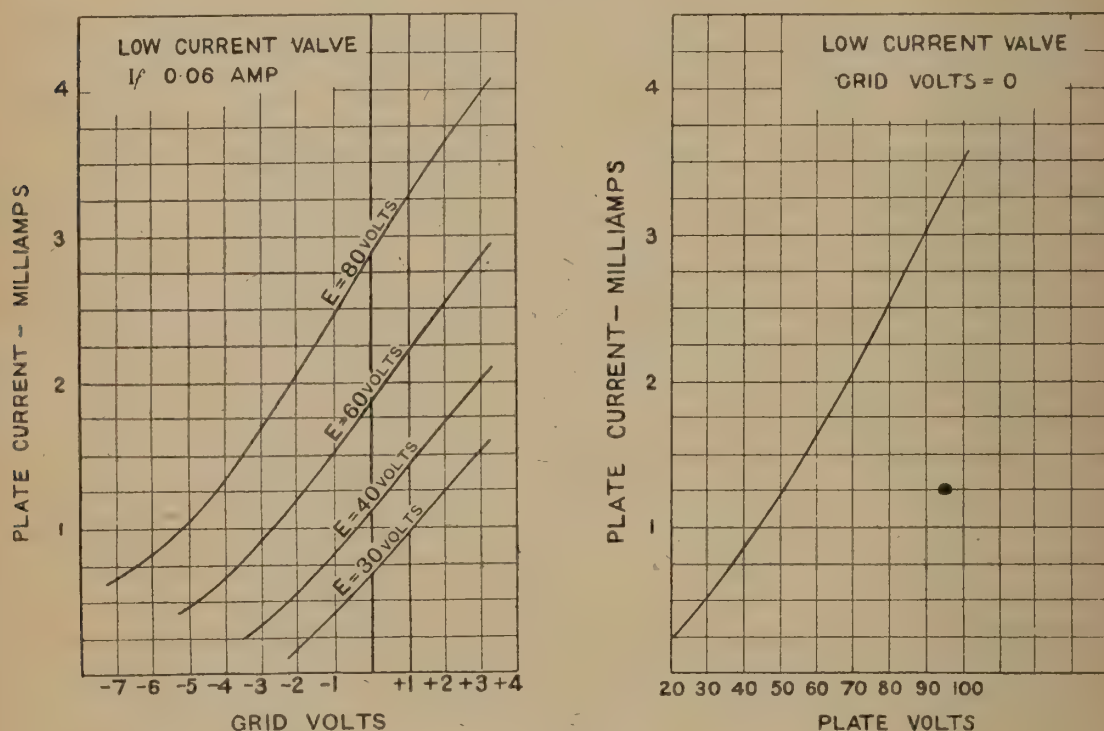
For a long time this proved to be a difficult problem, for although thoriated tungsten wire is easily manufactured, the use of such wire will not, in itself,

procure permanent low temperature emission. The thorium must be brought to the surface of the wire, and must, of course, remain there, so that the emission at a given temperature will be maintained throughout the life of the valve.

The latter condition is the most difficult to ensure, and it may be said that all valves will not be found to meet it, for, although when new they will give a definite and sufficient emission, yet, after little use this may be found to decrease, in some cases to a value which will be little, if any greater than would be obtained from an ordinary filament running at the same temperature.

The superiority or otherwise of any particular make of valve can therefore be gauged by its life to a definite decrease in emission at normal filament voltage and current.

The silvered appearance of the 60 milliampere valve is incidental to new methods of exhaust by which quantity production at a reasonable cost has been obtained, and is in no way detrimental to the valve.



Figs. 2 & 3. Characteristic Curves for Low-current Valve.

Figs. 2 and 3 show average characteristics for a low current valve, and these will indicate the circuit conditions from which the best results may be expected for the different functions which it may be called upon to perform.

It will be seen that while it is admirably suited to the purposes of detection and H.F. amplification, it will also give excellent results when used as a low frequency amplifier in conjunction with loud speakers of the smaller size such as would be used in an average room.

In this case the amplifying valve, or valves, should run with anode voltage increased to 60 or 80 volts, and the grid return connected to the negative end of the filament battery through a biasing battery to give the grid a negative bias of 3 to 4 volts.

Under these conditions, provided that transformers of good design are used, high amplification without distortion should be obtained, while the low tension battery current is such as could be taken from primary batteries, or, if preferred, from small secondary cells, in which case the trouble of recharging will be reduced to a point where it has only to be done at comparatively long intervals.

THE IDEAL EMPIRE WIRELESS CHAIN

By ROBERT DONALD, LL.D.

THERE is a difficulty in dealing with the Imperial Wireless Chain which has been discussed for fifteen years in as much as, at the time of writing, it does not exist even on paper. It is impossible to avoid a feeling of disappointment when the position of the British Empire in this respect is contrasted with the achievements of other nations. There have been interminable discussions, numerous parliamentary debates, volumes of questions and newspaper articles, stacks of resolutions, piles of opinions, long inquiries by commissions and committees. All these proceedings have only led to abortive schemes. In the meantime other nations have conquered the wireless world. British interests and British inventions have shared in that triumph—outside the Empire. We are mere onlookers at this marvellous conquest of science made possible by the genius who brought the fruits of his inventions to England and placed them at her service.

Briefly the position of long distance wireless in the world to-day is as follows :—

The United States Government own and operate ten high-power stations which spread their network northward to Alaska and westward to the Philippines. The French Government have eight high-power stations including the powerful station at Bordeaux, which is of world-wide range. The Japanese Government and the Italian Government have also powerful long-distance stations. The British Government have two in operation, the stations at Leafeld and at Cairo, neither of them of long range as compared with those mentioned above and both equipped with apparatus designed in 1913, now in a state of obsolescence and being replaced by more modern plant. The other Government-owned and operated stations in England are of smaller capacity.

The British is the only Government which now attempts to operate commercial wireless. In other countries Government operation is confined to official wireless—the outside world being left to private enterprise for the dissemination of news and commercial messages of all kinds. The following are the chief long-distance stations now in operation for the transmission of news and commercial messages throughout the world :—

France has a group of powerful stations at Ste Assise near Paris, of world range. The Germans have two world stations at Nauen and Eilvese. The American Radio Corporation established last year stations at Long Island comparable to the French stations at Ste Assise. Italy possesses long range stations at Coltano and Rome ; Japan has a powerful station of world-wide range at Iwaki, and a combination of Anglo-French-Japanese interests are opening a station of similar capacity at Pekin. A new station erected under the consortium of the big companies is now in operation in Buenos Aires for daily communication with Europe. A Dutch wireless company communicates directly with Java and the Dutch East Indies. American interests have completed the erection of a station of world-wide range at Warsaw, which is now in daily communication with the United States. There is nothing comparable to these stations in Great Britain. The Post Office Leafeld station can transmit messages up to between 3,000 and 4,000 miles with fair regularity but cannot at present be relied upon beyond that distance. The Marconi station at Carnarvon is the best now in operation in England, but its reconstruction has been held up owing to the uncertainty of Government action. The Marconi station at Clifden (Ireland) for communication with Canada was destroyed by the revolutionary troops in 1917.

The foregoing is a brief statement of the comparative progress of wireless throughout the world, and is almost negative as regards the position in Great Britain.

In order to escape from the controversial and political aspects of Empire wireless I will sketch very briefly what I think the ideal system should be. In doing so we must keep in view the value of wireless for commerce and newspaper purposes, and envisage a system capable of spreading news throughout the British Empire, of linking up Dominion with Dominion, colonies and territories and enabling all the States in the Commonwealth to communicate with each other and with Great Britain. Everyone admits that existing cables are altogether inadequate as the chief means of Empire communication and that it is highly improbable that new cables will, in the future, be laid down. When I began discussing this question of wireless from the point of view of news transmission I said that our claim, or case, was that wireless telegraphy was necessary not to supplant or to act as an alternative, but to supplement cables. That was only a few years ago, but practical experience in the meantime leads me to reverse the order and to say that cables are now only required to supplement, and not to be an alternative of wireless. That is provided always that we were abreast of other countries.

Fourteen years ago when wireless emerged from the short range stage and was giving practical demonstration of its power to bridge continents, the British Government took up the problem seriously, recognising that to no country in the world was this new means of communication so essential. In 1913, the British Government entered into a contract with the Marconi Company to build the Empire Chain. This scheme provided for covering the Empire by a series of stages from stations varying in distance from 1,200 to 4,000 miles, which was apparently considered at that time as the limit for reliable transmission, although the scheme included a link between Australia and Vancouver, a distance of 6,720 miles. Had the scheme been carried through the Empire would have had a complete wireless chain in operation in 1916, but the war caused the Government to break the contract and scrap the scheme at a time when wireless was making immense strides in consequence of pressing naval and military needs. While the British Government found itself unable to carry out its scheme on account of the war, the French Government seized upon the war to overtake the progress made by Germany.

To come to the ideal Empire Chain: it should cover the whole British Empire with a network of wireless communications. These communications should be capable of spanning continents and bridging oceans. One grand trunk line, for instance should link up England and Australia, capable of communication for a certain number of hours every day without interruption eastward, and by relaying through Canada, westward. Having established successfully this longest trunk route there would then be other main lines in association with it, serving India, New Zealand, the Far East, Africa, Canada and the Pacific and the West Indies with off-shoots, bringing within the radius of wireless the most distant outposts of Empire. All these stations would be feeders as required of the main trunk lines. All the Dominions and Colonies of the Empire should possess transmitting stations capable of sending messages to the stations with which they are in communication. The services should be reciprocal and universal.

Each division of the Empire would supplement the Imperial system by national networks, so that the empty spaces in Australia, so vast that England could be dumped into them and lost, would be bridged by wireless; the sparsely populated prairie provinces of Canada would also be wireless so that there would be no more isolated homesteads. The settled communities on the coasts of Africa, separated by tropical jungles, deserts and uncivilised regions from other white settlements, would be on speaking

terms. The pioneers who ventured furthest north or furthest south into the Polar seas, cut off by thousands of miles from mankind, would be kept in touch with civilisation. There would be no more isolation in the world.

The universal service of news and communication would make the whole world of Empire kin. Under such a scheme there would be no confusion or overlapping as with coming developments of wireless science would enable each region to have its own wavelength and be kept as distinct as if it were a telegraph line. Secrecy will also be secured so that news messages could not be appropriated, and with automatic transmission and reception speed would reach a rate of over 100 words per minute. We shall then be coming closest to the ideal; communications adequate, efficient, cheap, speedy, secret and universal.

How best can this ideal plan be put in operation?

In the first place it should not and could not conveniently be separated from the rest of the world. An efficient Empire Chain can cover not only that part of the British Empire which occupies one-fifth of the habitable globe, but also every other country. An Empire system of long-distance stations would be in the best position to carry on business with other nations after the needs of the Empire have been first safe-guarded. London has been the chief centre of world communication by cable and it is in a still more favourable position to be the chief centre of communication by wireless. The Empire Chain should be designed to meet all the strategic needs of the Empire in regard to defence, supplementary to the naval, military and air service wireless systems. The States of the Empire should also lay down the conditions under which wireless should be operated and make provision for taking possession of it in times of national emergency.

When we come to discuss who should own and operate this ideal Empire Chain we are approaching the region of controversy. There can, in my opinion, be no question that as regards operation, the most efficient results will be secured under private enterprise. All Governments of foreign countries, except for official purposes, have given up wireless beyond their own borders. At this stage of wireless communication there are risks ahead, inventions to be developed, research to be carried on, experimental work to be undertaken, all of which can generally be better carried out by individual enterprise than by government departments. The ideal Empire Chain cannot be fashioned upon things as they exist to-day but on inventions now only in course of development. The future belongs to wireless telegraphy and its twin wireless telephony, and what has been accomplished up to now is only an index of the far more marvellous achievements which awaits mankind.

PROGRESS IN WIRELESS TELEGRAPHY IN THE BRITISH MERCANTILE MARINE DURING 1923.

By Commander J. A. SLEE, C.B.E., R.N. (Ret.)

AUTOMATIC APPARATUS.

THE largest of the Trans-Atlantic liners have been fitted with high speed automatic receivers and transmitters in order to enable them to handle their very heavy traffic without monopolising the attention of coast stations for too long a period. Fig. 1 shows the outline of the circuits used for high speed transmission.

The aerial circuit is magnetically coupled to a closed circuit which is kept in a state of constant oscillation by the transmitting valve. The coupling between the closed and open circuits is arranged in two equal parts which are opposed to one another. The act of signalling consists in short circuiting one half of this coupling, and so allowing the transfer of energy from the closed to the aerial circuit to take place through the remaining unbalanced portion.

In order to keep the load on the transmitting valve constant an artificial resistance is inserted in the closed circuit, which is short circuited at the same moment that the compensating half of the coupling coil is short circuited. This allows of fairly high speed transmission without the slightest trouble from sparking at the key contacts. Speeds from 60 to 90 words a minute are worked as the circumstances of the moment may dictate.

The source of supply is the standard nominal $1\frac{1}{2}$ kw. valve transmitting panel, the supply to the anode of the transmitting valve being approximately 1.2 kilowatts. The aerial current for a prolonged dash is about 7 amperes and the effective range of transmission at 90 words a minute is about 700 miles. The high speed keying is carried out by means of a Wheatstone or Creed transmitter working from a perforated tape.

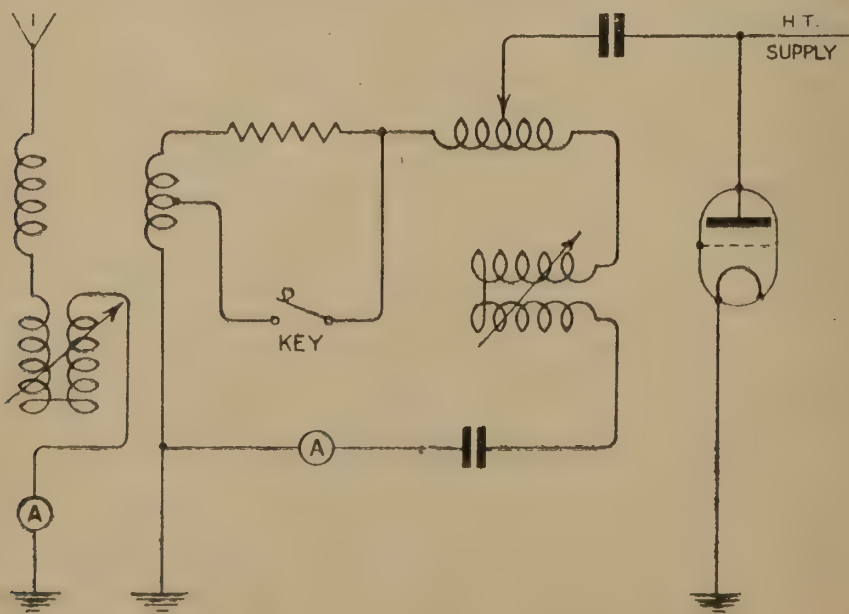


Fig. 1. High Speed Transmitter.

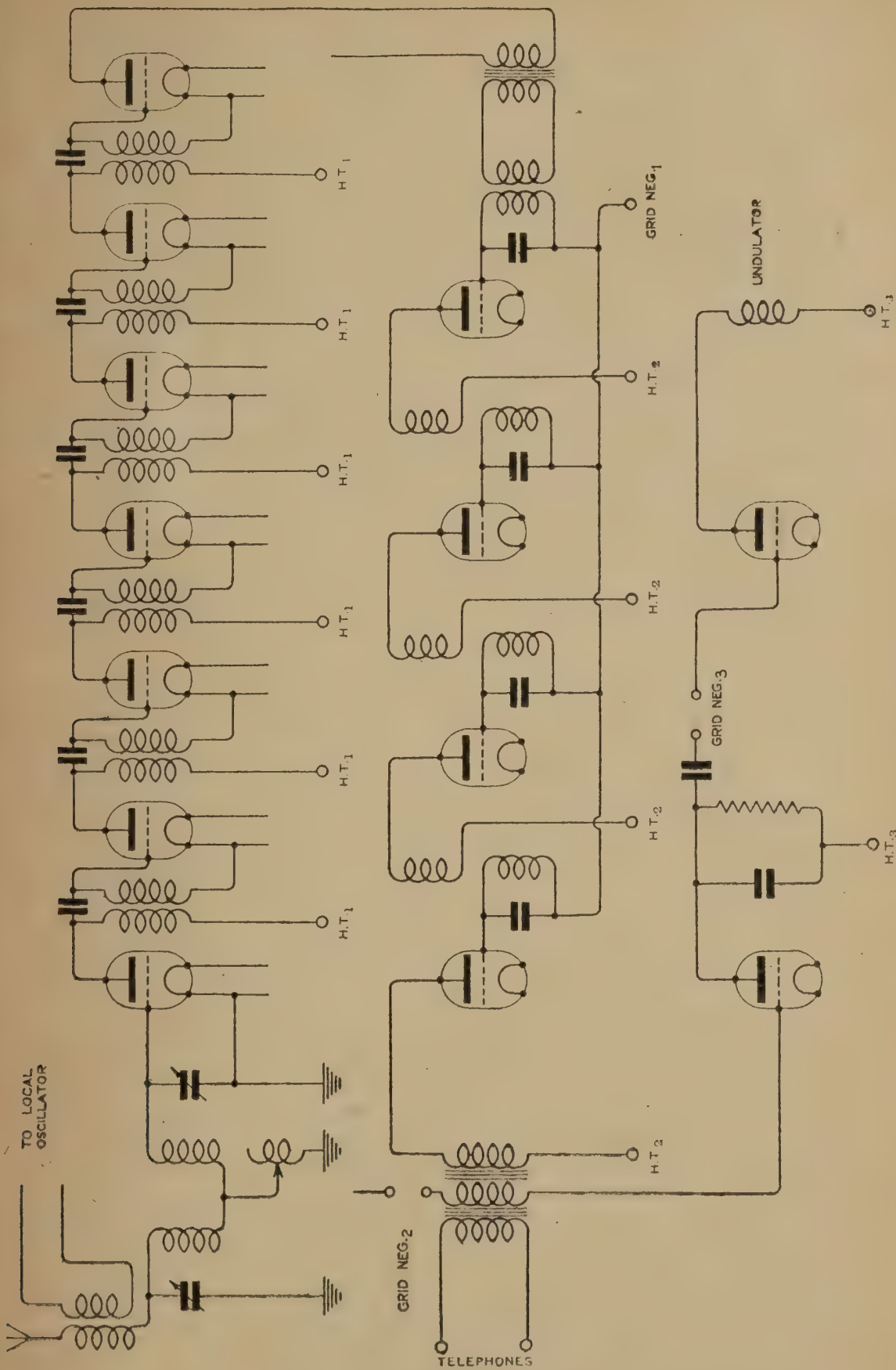


Fig. 2. High Speed Receiver.

The aerial used is a single steel wire. Two aerials are fitted in the form of inverted L's, back to back. The longer portion is used as a transmitter for continuous wave (2,000 to 2,600 metres) and the shorter portion is used as a transmitter for spark waves (300 to 800 metres), and double reception can be carried out by using the two aerials as independent receivers.

The circuits used for high speed reception are shown in outline in Fig. 2. The apparatus consists first of all of the usual loosely coupled circuits tuned to the frequency of the wave which it is desired to read, the high frequency current being amplified by six high frequency valves working in a transformer-coupled amplifier of the well-known "55" type. The circuit is acted upon by a local oscillator, the tuning of which is arranged to be very accurate, a tangent screw being fitted to the adjustable condenser in order that the beat frequency may be fixed with great precision. After rectification the rectified current now at the beat frequency is passed through a four-stage low frequency tuning circuit. This consists of a four-valve low frequency amplifier, each of the grid circuits being tuned to the pre-determined beat frequency, the anode circuit of one valve being loosely coupled to the grid circuit of the next.

Such a device gives very considerable magnification to sounds of a pre-determined frequency, but the magnification is less than one to one for any signals differing by but a very small amount from the frequency of the filter. Hence the necessity for a tangent screw to give exceedingly fine adjustment of the local oscillator frequency, which of course determines the pitch of the beat note.

After passing through the filter the signals are again rectified and applied to the grid of the valve which operates the recording device. The anode current from this last valve is used to actuate the recorder, the current being to all intents and purposes a direct current whose strength varies between practically zero and about 9 milliamps. Extremely satisfactory results have been obtained at sea from undulators of the type introduced by Dr. MacLachlan. These are very reliable in operation and completely proof against vibration and movement of the ship. Receiving speeds up to about 100 words a minute are obtained by these means.

The automatic recorder is exceedingly useful as, in addition to its use for the reception of high speed signals, it can also be switched on and allowed to record ordinary hand speed messages, such as press messages, while the ship's operators can be employed in reading messages on other wavelengths independently of the recorder. It should be realised that double reception, that is to say, reception of signals on two different wavelengths at the same time in the same ship, is now a common practice in these very large vessels.

When working at hand speed the transmitting range of these big ships is about 1,700 miles on C.W. and about 800 miles on spark.

MARINE DIRECTION FINDER.

Steady progress has been made in the reliability and accuracy of the Marine Direction Finder, and as the number of British merchant vessels fitted with this instrument increases it becomes possible to obtain confirmation of the limits of the areas in which distorted bearings must be expected, due to the presence of land between the transmitting coast station and the ship.

A study of the records of bearings taken shows that less than 10 per cent of those taken (when the ship is not within the suspected "bad" areas) have an error of more than 2 degrees, more than 80 per cent. having errors no greater than one degree.

The approximate boundaries of the "bad" areas of the English Channel and the Gulf of St. Lawrence are shown in Figs. 3 and 4. Similar sketches are being prepared for other waters and this subject is becoming more clear and definite as further information comes to hand.

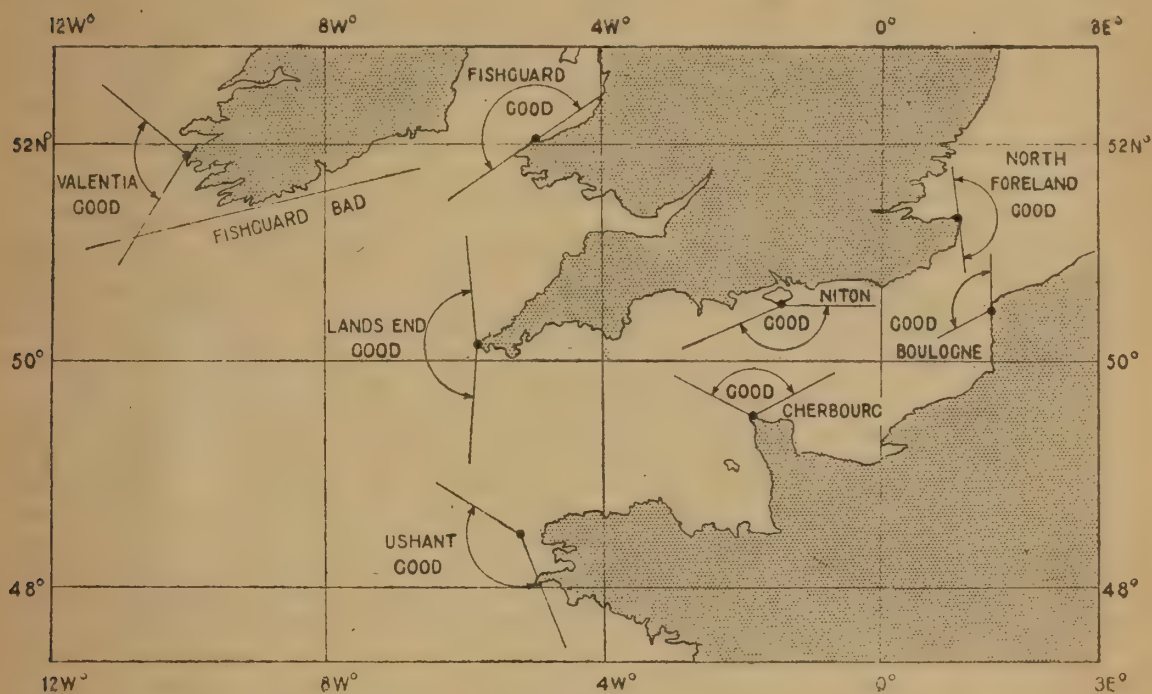


Fig. 3.

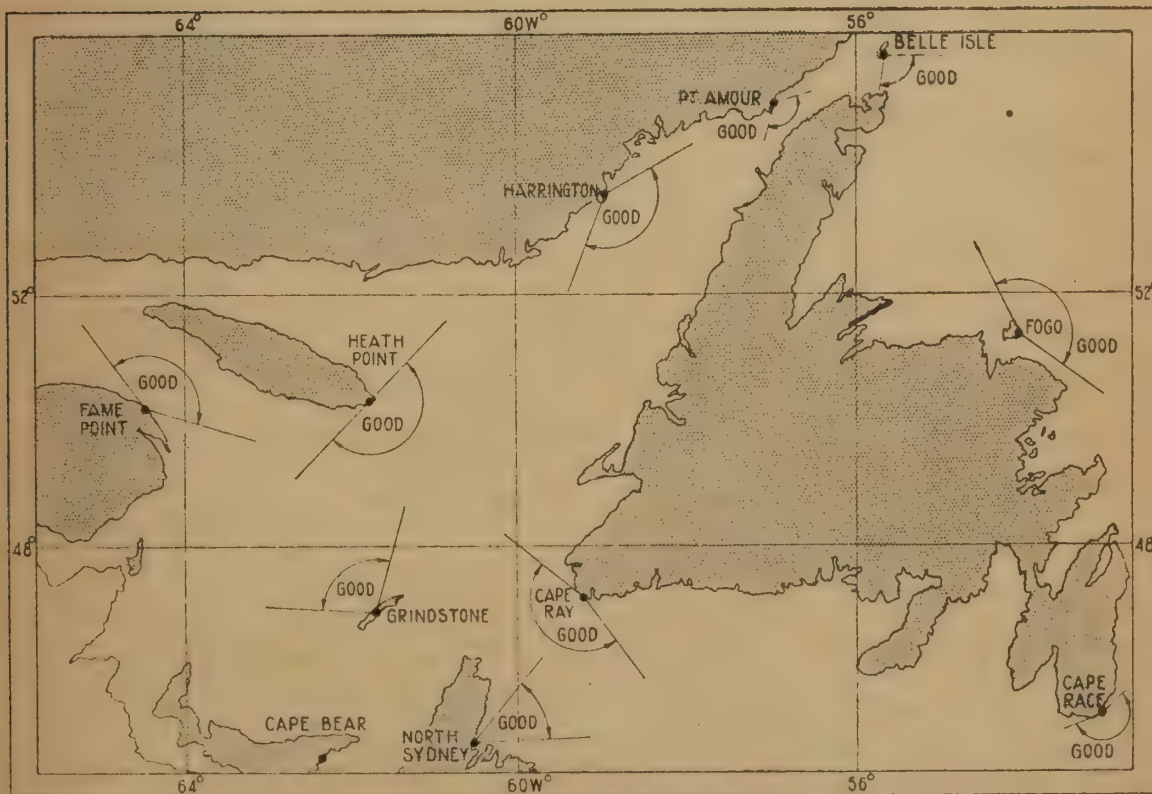


Fig. 4.

REVOLVING BEAMS.

Perhaps the most important of all the advances made in the application of wireless as an aid to navigation is the revolving beam. Mr. Franklin's paper read before the Institute of Electrical Engineers gives the details of the projector and receivers as used at the experimental station at Inchkeith, and a much improved station is now being erected at South Foreland. Fig. 5 shows the Inchkeith Projector.

These stations transmit a wireless signal on an exceedingly short wave (about 6 metres) in the form of a very fairly concentrated beam, and the whole apparatus of the transmitter can be rotated bodily on a turn table (Fig. 5).

Special receivers suitable for this exceedingly short wave telegraphy can be fitted and by their aid the signals sent out by the revolving beam transmitter can be received. This altogether abnormal form of telegraphy is entirely free from interference from other signals, and, in consequence, there is no difficulty in reading simple signals such as the single letters transmitted. For this reason it is not necessary to make use of the services of a skilled telegraphist, and navigating officers have no difficulty in learning to use the receiver for themselves.

The arrangements of the beam transmitter are such that signals will fall to about half their maximum strength about 10 degrees each side of the axis of the beam, falling away to practically zero, a further 10 degrees each side of the axis.

The method of signalling bearings by means of the beam is as follows :—

As the projector is rotated a contact finger passes over studs on the turntable, which are arranged so as to produce a different letter, selected from the longer Morse letters, at each two points of the compass. A ship at the normal working range of the beam would thus hear either two of these long letters fairly loudly, in which case the bearing would be between them, or she would hear one long letter faintly, then one loudly, and a third faintly. This gives a rough indication of the bearing, but in order to allow of the bearings being read with a degree of accuracy sufficient for navigational purposes, the arcs between the long letters are split up by three equally spaced short letters, each representing a half point of the compass. The letters in use are a T (one long) at the intervening points of the compass and an I (two shorts) at the intervening half points of the compass. As the beam passes over a ship the navigator would hear something of this kind: T I L I T I Q I T I.

With the receiving instrument a disc is provided marked in half points of the compass and fitted with two pegs which the observer can stick into the disc at the first and last sound which he hears, and he can then rest assured that the bearings will be mid-way between the points indicated by the two pegs. This gives an accuracy of bearing of a quarter of a point.

The whole subject is still in its infancy, but it is felt that the use of this great boon to navigators will extend rapidly in the near future.

The range at which bearings can be obtained from Inchkeith with accuracy and certainty is 10 miles, about double this range being expected from South Foreland, and it has been shown that although the range of the beam may be reduced by the presence of intervening obstacles, yet there is no action tending to distort the path of the beam, and therefore this method of giving directions is not susceptible to any electrical error. Also it should be noted that this method of signalling the bearing is independent of the rate of revolution of the projector.

The absorption experienced by such very short waves is very great, so much so that it is not possible for a receiver fixed on the distant side of a ship to perceive the signals, and therefore in practice two receivers have to be fitted, one at each end of the bridge, in order to make certain that one at least of them will be operative under all conditions.

The receiver itself consists of two brass rods about a yard long, fixed vertically and end to end, projecting from a small case which contains the tuning appliances. An amplifier and telephones are fitted in the chart house of the vessel, and when the navigator believes himself to be within range of a revolving beam projector he switches on the amplifier and listens.

Of course there is no difficulty in joining up a loud speaker, in which case it would give audible warning should the vessel come within range of the beam.

The receivers must be permanently tuned, and therefore the beam transmitter must be standardised as to wavelength, and the letters used to indicate the alternate points of the compass. All should signal true bearings. The short letters used at the half points should not be standardised, so that if two beam transmitters are in operation in the same neighbourhood it will be necessary to make some kind of distinction between them, and this can best be done by making use of various combinations of short letters. Thus, one beam might use I T I, another I S I, another I N I, another I A I, and any of the large number of possible combinations.

SETS FOR SHIPS' LIFEBOATS.

A further advance has been made in the application of wireless as a factor helping to reduce the risks run by seafarers, in the form of further improvements in apparatus designed for use in ships' lifeboats. The new set meets the following requirements:—

Transmitter.—Range over sea to an ordinary ship fitted with a crystal receiver, using a wave of 600 metres—50 miles.

Receiver.—Directional. Bearings can be obtained of an ordinary ship transmitting on 600 metres at 50 miles. All-round reception from an ordinary ship about 100 miles. Crystal alternative provided.

Space occupied is the seating accommodation of two men.

Weight is less than that of two "official" men; viz., 3 cwt.

Endurance—Transmitting. Eight hours divided into periods of 10 minutes; that is to say, for 10 minutes in each hour for 48 hours.

Endurance—Receiving. Twenty-four hours on all-round reception; that is to say, for half of each hour for 48 hours, plus two hours on D.F. reception.

To achieve the above results, a transmitter having a nominal input of 250 watts is employed. This, working in conjunction with a suitable type of aerial, can produce at least 20 metre-amps without over-rigging the standard 26 ft. open lifeboat, which is the smallest boat in common use.

Power is supplied by a special petrol engine driving an alternator, a fuel supply of about two gallons being provided so as to give a factor of safety of over two. The masts are light spars 22 ft. long placed as far apart as possible. They can be handled with ease in a seaway.

The receiver consists of a 6-valve amplifier using dull emitter valves—4 high frequency, one rectifier and one note magnifier. All are used for D.F. purposes, but only three for all-round reception.

The directional element is provided by a rotatable frame, having a pointer travelling over a movable scale graduated in points of the compass. This scale is set to correspond to the direction of the boat's head by compass, and since the deviation in a boat is not likely to be much the bearings obtained in this way will be, roughly speaking, magnetic bearings.

When the set is used in open boats, the whole is contained in a weather-proof compartment which is large enough to give shelter to the operator as well as to the instruments. Its dimensions are 2 ft. 6 ins. fore-and-aft by 2 ft. athwartships by 4 ft. high. It is placed between two thwarts well aft in the boat and stands about 2 ft. 6 ins. above the gunwale. The direction-finding frame is stowed inside the compartment when not required, and when in use it is fitted into a socket on the top of the compartment. The wireless masts and aerial can be used at the same time as the boat's sails.

In the case of motor boats the set can be fitted in a similar compartment, or it can be distributed in units in any convenient place where adequate shelter is available.

Advantage has been taken of the power supplied by the engine and alternator by fitting a powerful lamp on the top of the compartment which can be illuminated as an alternative to transmitting by wireless. It can be used to give a steady light or for Morse signalling. The light is of great use as providing a rallying point to other boats of the same ship during darkness, to guide the receiving ship when she is near and to give a light when getting the masts up if this has to be done at night.

SOME POLAR DIAGRAMS OF RECEPTION FOR SYSTEMS OF SPACED AERIALS

By R. KEEN, B.Eng., A.M.I.E.E.

IN the study of Direction Finding or Directional Reception it is convenient to have some method of illustrating graphically the receiving properties, for various angles of incidence of the incoming wave, of the aerial systems under consideration. The scheme which seems the most logical and which is almost always adopted is that of the plane polar diagram in which the radii from a certain point in the diagram, which represents the centre of the aerial system, denote by their lengths the intensities of received signals in the respective directions in the horizontal plane, it being assumed that the field strength of the wave is the same for all angles of incidence. Thus, the polar diagram of reception of a vertical open aerial will, in the case of a uniformly conducting earth, etc., be a circle with the aerial as centre.

The open aerial, spaced open aerials, frame aerial and systems of frame aerials, all have extensive application in modern directional reception and as we dip more deeply into the problems involved, the necessity arises for more complete methods of portraying their receiving properties. For direction finding by the "minimum signal" method, the polar diagram of reception should display a sharply defined minimum or zero value such as that of the diagrams of Fig. 6, whereas in the case of commercial traffic circuits we need an aerial system which gives a well defined beam of reception together with the largest possible "blind angle" or sector of zero reception and these characteristics may be represented by the plane polar diagram. It is also of interest, however, to be able to portray the receiving qualities of an aerial system in respect of waves such as are met with in practice which have also a zenith angle of incidence, that is to say, which are tilted so as to make an acute angle with the horizontal plane. In order to investigate these three dimensional receiving properties of an aerial system, the method which at once suggests itself is the solid polar diagram and by means of this arrangement it is possible to form a much more complete conception of the value of any given aerial system.

POLARISATION OF THE ELECTROMAGNETIC WAVE.

So far as the azimuthal properties are concerned, that is to say, the receiving properties in connection with waves which arrive direct from the transmitter, having travelled along the surface of the ground, it is necessary to consider only the normally polarised wave in which the lines of electric

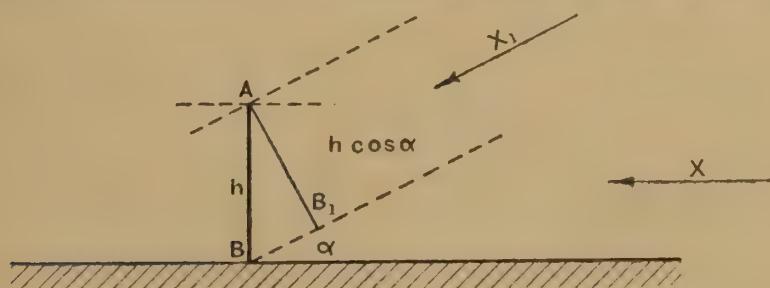


Fig. 1. Equivalent of reduction in height of a vertical open aerial in the case of a wave arriving, normally polarised, in the direction XI.

force are vertical and the magnetic force horizontal. Any component of the magnetic force perpendicular to the earth's surface which may exist near the transmitter will be eliminated, leaving only the horizontal or normally polarised component. In the case of the wave arriving with a certain degree of zenith angle, as in Fig. 1, then according to modern theory the polarisation

of the wave may be twisted through any angle and the wave may, in fact, not be a plane wave at all, but may have out-of-phase components resulting in rotating fields. Clearly to construct polar diagrams of reception for every condition of polarisation is impossible, but a great deal of interesting information may be obtained from the consideration of the solid diagrams of reception of a number of aerial systems, taking into account only normally polarised waves.

THE VERTICAL OPEN AERIAL.

Let Fig. 1 represent a view of an open aerial AB with incident wave in the direction shown by the arrow X. From the symmetry of the aerial and the supposed uniformly conducting earth, the reception must be the same for all horizontal angles of incidence and the polar diagram of reception in the horizontal plane will be a circle. Now consider the case in which the wave has a certain vertical angle of incidence α . A convenient way of arriving at the E.M.F. which will be induced in the aerial under these conditions, is to consider the degree of linkage of magnetic field of the wave relative to the linkage when the wave is travelling along the ground. Assuming the

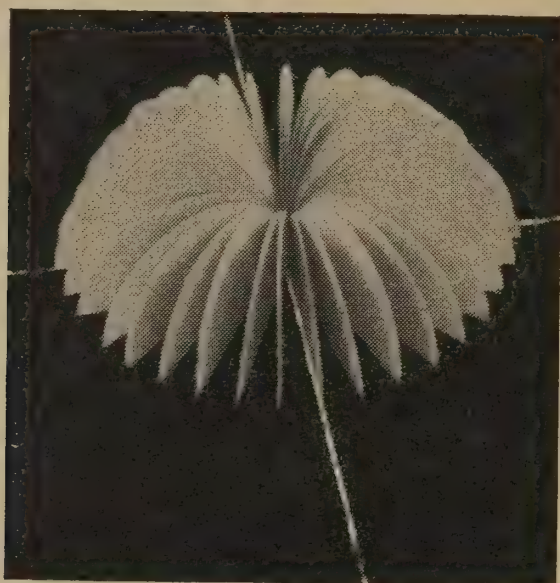


Fig. 2. *Three dimensional polar diagram of reception of normally polarised waves, by vertical open aerial.*

field intensity of the wave to be the same in each case, the linkage will be proportional to the projected length of aerial conductor in the direction of propagation of the wave, namely X_1 and this will be $h \cos \alpha$. It may be noted that no E.M.F. can ever be induced in a vertical open aerial by a wave having the electrical field horizontal and the magnetic field vertical for in this case the magnetic field will always be parallel to the aerial and there can be no linkage. When the wave is arriving vertically downwards (an unlikely occurrence) $\cos \alpha$ is zero and there is again no reception which is to be expected as there can be no linkage in this case either.

The expression for the resulting three dimensional polar diagram for a normally polarised wave will therefore be:—

$$E_{a\theta} = E_v \cos \alpha$$

E_v will be taken throughout to be the E.M.F., induced in a vertical open aerial—or in a vertical limb of a frame of the same height—by a normally polarised wave travelling along the ground. $E_{a\theta}$ is the E.M.F. induced in the aerial—or system of aeri-als—by a normally polarised wave with zenith angle and azimuth with respect to some arbitrarily chosen direction. Owing to

the effects of reflection from the earth's surface the actual diagram of a real aerial under these conditions would not be quite such a simple figure, but neglecting these complications, the reception will be as in Fig. 2 which is a model of the solid diagram. The model was constructed by taking a stiff sheet of card to represent the ground, choosing a point at the centre as the position of the aerial and then erecting 36 pieces of thinner card equally spaced radially about the centre, each piece having been cut to the shape which corresponds to the reception for varying zenith angles in its vertical plane, and since the expression has been seen to be $E = E_r \cos \alpha$, each of the small cards will be a semi-circle. This scheme has been adopted throughout the remainder of the solid diagrams to be discussed, namely that the reception for varying zenith angles has been plotted on a card for every 10° of azimuth and in every case, unless otherwise stated, it is assumed that the wave is normally polarised.

SPACED OPEN AERIALS.

With one or two notable exceptions the bulk of directional reception and direction finding is carried out by the use of aerial systems which depend for their directive effects upon the properties of spaced aeriels, the E.M.F.'s in which are combined in suitable receiving circuits. The simplest case is shown in Fig. 3, in which two open vertical aeriels are spaced a distance d

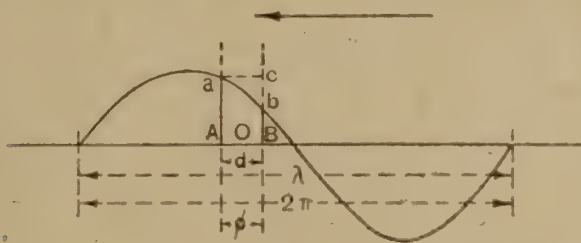


Fig. 3. Two open aeriels spaced in direction of travel of wave.

in the direction of travel of the wave, the instantaneous field strength of the wave being shown conventionally by means of the ordinates Aa and Bb of the sine curve of wavelength λ . Calling the spacing of the aeriels ϕ where

$$\phi = \frac{2\pi d}{\lambda}$$

we can draw a vector diagram for the system. In Fig. 4, OO' represents the phase of the centre point of the aerial system, or in other words, we will reckon time from the instant the wave front arrives at O in Fig. 3. Now the wave reaches the aerial B earlier than the point O by a time proportional to $\phi/2$ and similarly it reaches A $\phi/2$ later than O. E_b therefore represents the E.M.F. in the B aerial which is shown leading on OO' and E_a is the lagging E.M.F. in the A aerial, both being $\phi/2$ out of phase with OO'. If now the associated circuits be so arranged that the aerial currents I_b and I_a , which are in phase with their respective E.M.F.'s, induce E.M.F.'s E_b' and E_a' in a common receiving circuit and further, that these two E.M.F.'s are in opposition to one another, then we have the case shown in the diagram where E_b' and E_a' are lagging 90° on the currents which are inducing them and E_b' has been reversed before obtaining the resultant E_r . Since the total phase difference between E_b' and E_a' is ϕ , the resultant is proportional to:—

$$\sqrt{E_r^2 + E_r^2 - 2E_r^2 \cos \phi}$$

where E_r is the E.M.F. induced in either aerial.

This is equal to:—

$$\sqrt{2} E_r \sqrt{1 - \cos \phi}$$

from which we see that the resultant E.M.F. is a maximum when $(1 - \cos \phi)$ is a maximum, that is to say when $\cos \phi$ is equal to -1 and $\phi = 180^\circ$. In

other words, the resultant E.M.F. is a maximum and equal to $2E_r$ for a spacing of half a wavelength, $1\frac{1}{2}$, $2\frac{1}{2}$, etc., and is zero for a spacing of a wavelength or a multiple of a wavelength.

The above condition is that in which the aerials are spaced in the direction of travel of the wave but the important case is that in which the wave has any other horizontal angle of incidence. Let Fig. 5 represent a plan view of two spaced aerials in which the direction of an incident wave is along the line POP' making an angle θ with the line of the aerials XOX'. In this case Ob will be a measure of the leading phase of the E.M.F. in B where Bb is a perpendicular dropped on the line POP'. Similarly Oa is the lag in the A aerial and the total phase difference is ab which is equal to $d \cos \theta$ or $\phi \cos \theta$ where $\phi = \frac{2\pi d}{\lambda}$. The diagram showing the vector difference of E.M.F.'s for

these conditions is the same as in the previous case, Fig. 4, except that the angles of lag and lead of the E.M.F.'s in A and B are $\phi/2 \cos \theta$ instead of $\phi/2$. The resultant E_θ is therefore:—

$$\begin{aligned} & \sqrt{2 E_r^2 [1 - \cos (\phi \cos \theta)]} \\ &= \sqrt{4 E_r^2 \sin^2 (\phi/2 \cos \theta)} \\ &= 2 E_r \sin (\phi/2 \cos \theta) \end{aligned}$$

where E_r is the value of the E.M.F. in either aerial.

In Fig. 6 curves are shown for a number of values of ϕ and it will be noticed that as the spacing becomes small compared with the wavelength the polar diagram approaches in shape that of the "figure eight," or cosine diagram. This is clear from the expression above, for, when ϕ is small, $\phi/2 \cos \theta$ is also small and we may write:—

$$\sin (\phi/2 \cos \theta) = \phi/2 \cos \theta$$

Therefore, $E_\theta = 2 E_r \phi/2 \cos \theta = E_r \phi \cos \theta$,

which means that the maximum value of the resultant E.M.F. is reduced to a small value equal to ϕE_r or $\frac{2\pi d}{\lambda} E_r$, and it follows the cosine law for various values of θ . As θ passes through 90° the E.M.F. in the B aerial in Fig. 5 will cease to lead on that in A and will lag so that there will be a complete

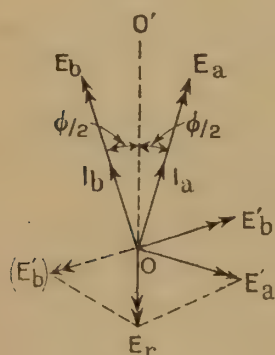


Fig. 4. Vector diagram for two open aerials, spaced in direction of travel of wave.

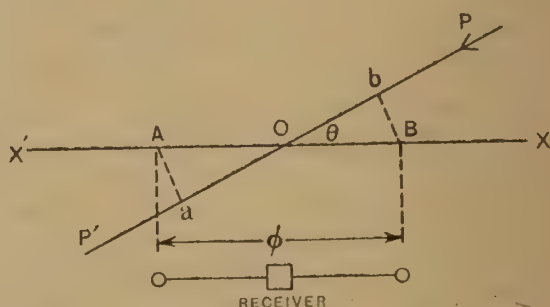


Fig. 5. Plan view of two open aerials, spaced in direction making angle θ with direction of travel of wave.

reversal of phase as the resultant E.M.F. passes through its zero value and the quadrants in Fig. 6 may be marked +ve and -ve as shown.

The alternative case in which the vector sum is taken of the E.M.F.'s in the two aerials instead of the vector difference would give another set of

curves, but it is the polar diagrams of the differential action of spaced aerials which have the greater value for directional work.

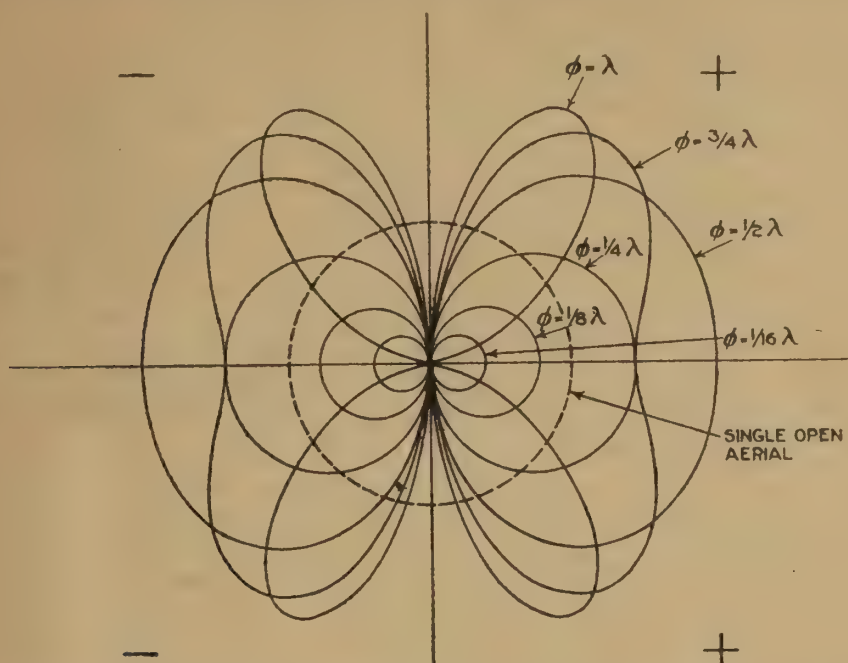


Fig. 6. Polar diagrams of reception for two open aerials, with various spacings.

THE FRAME AERIAL.

When the spacing ϕ of the aerials is small, the simplest way of combining them so that the E.M.F.'s may be in opposition is by connecting the tops of the aerials by a conductor and the bottoms by a second conductor containing a coupling coil to the receiver. By this means it is assured, as shown in Fig. 7, that E.M.F.'s in the same direction in the aerials, that is to say, both up or both down at any instant, will always be in the opposite direction round the aerial circuit. We now have a frame aerial and the assumption made above that for small values of ϕ , $\sin \phi = \phi$, is equivalent to saying that when the frame aerial is small enough compared with the wavelength, the instantaneous field intensity in the neighbourhood of the aerial may be considered as uniform and hence the linkage of the flux with the aerial is proportional to the spacing ϕ and to the cosine of the angle θ between the plane of the frame and the direction of propagation of the wave as in Fig. 8.

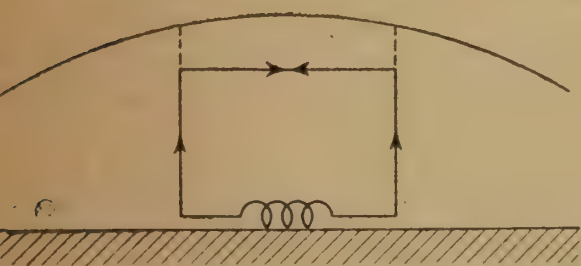


Fig. 7. E.M.F.'s in vertical limbs of frame aerial.

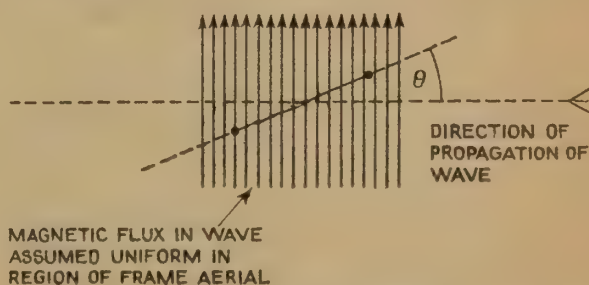


Fig. 8. Plan view of small frame in which linkage follows cosine law.

Note that the direction of linkage of the magnetic flux with the frame will reverse as θ passes through 90° thus producing the reversal of phase of the frame E.M.F. The vector diagram for the simple frame is as shown in Fig. 9 where the aerial E.M.F.'s E_u and E_v are opposed to one another and it will now be noticed that the resultant E.M.F., E_θ round the frame lags 90° on the flux in the wave and this is a characteristic of the frame aerial.

THE THREE DIMENSIONAL COSINE POLAR DIAGRAM.

In Fig. 10, the three axes XOX' , YOY' and ZO are mutually at right angles and a frame aerial is shown situated at the centre of the system with its plane in the vertical plane of the XOX' axis. The frame is shown conventionally as a thick line with dots at the ends to represent the vertical limbs. Consider firstly a wave incident horizontally along XO , that is to say when $\theta = 0$. In this case the resultant E.M.F. in the frame is pro-

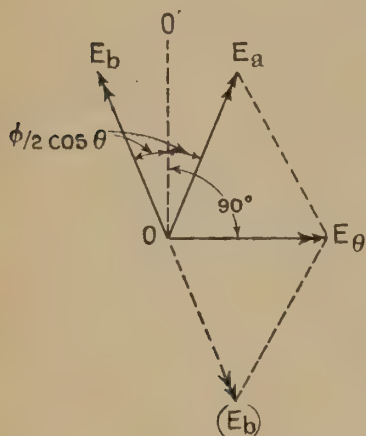


Fig. 9. Vector diagram for frame aerial, showing frame E.M.F. lagging 90° on flux in wave.

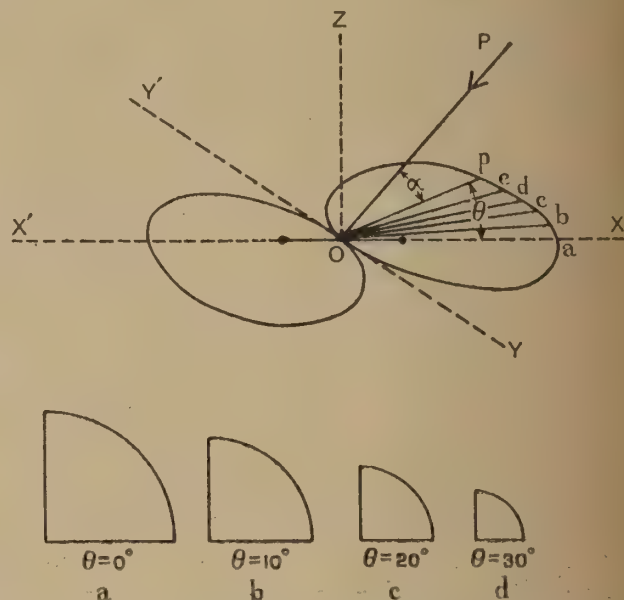


Fig. 10. Method of plotting three dimensional polar diagram of frame.

portional to Oa , the ordinate of the cosine diagram in the horizontal plane. It will also be clear that whatever the zenith angle α may be for waves



Fig. 11. Three dimensional polar diagram of reception of normally polarised waves, by frame aerial which is very small compared with the wave-length.

arriving other than horizontally, the linkage with the frame must remain constant since it is proportional to the area of the frame and hence the E.M.F. will be constant as long as the azimuth angle θ remains at zero.

For any other value of θ as shown in the figure the horizontal reception is again given by the ordinate Op of the cosine diagram which is equal to $Oa \cos \theta$ or in other words it is proportional to the linkage with a frame of area equal to the projected area on the vertical plane through POp , of the actual frame. For varying zenith angles the linkage with this equivalent projected frame will again remain constant so that the induced E.M.F. in the case of a frame, for normally polarised waves, is independent of the zenith angle of incidence. If, therefore, we plot a series of vertical or zenith polar curves for the frame reception for every ten degrees of azimuth they will consist of a set of quadrants of circles as shown in Fig. 10a, b, c, etc., the radii being equal to the radii of the cosine diagram.

The general equation of the three dimensional cosine diagram may therefore be written:—

$$E_{\theta, \alpha} = E_v \phi \cos \theta$$

where E_v is the E.M.F. in one vertical limb of the frame and ϕ is the spacing of the vertical limbs. The solid diagram is illustrated in Fig. 11.

"CENTRAL SUMMATION" AND "MIS-PHASING" OF AERIAL CIRCUITS.

In the case of the spaced open aerials, the method of combining the effects in the aerials may be termed "Central Summation" in that the receiving circuit is situated mid-way between the aerials, the individual aerial currents are in phase with their respective E.M.F.'s and hence any out-of-phase effect between the two E.M.F.'s induced in the receiving circuit is purely a function of the spacing of the aerials in the path of the wave and is not an artificially obtained effect.

NON-CENTRAL SUMMATION AND THE CARDIOID DIAGRAM.

Now, in certain circumstances it may be necessary to arrange for a phase relation between the E.M.F.'s in the receiver which is not to be obtained by central summation and a case of this is the Cardioid diagram shown in Fig. 14. Here we wish to provide for the two E.M.F.'s in the receiving circuit to be in complete phase opposition when the angle θ is zero and to be in phase when θ is 180° thereby giving unilateral reception for the purpose of directional reception or for determination of the "sense" of

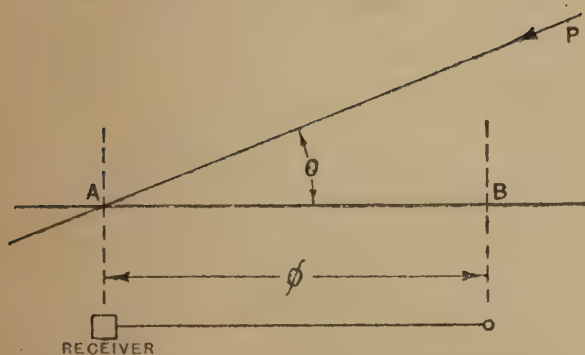


Fig. 12. Plan view of spaced open aerials in which special phase relations are obtained between E.M.F.'s by non-central summation.

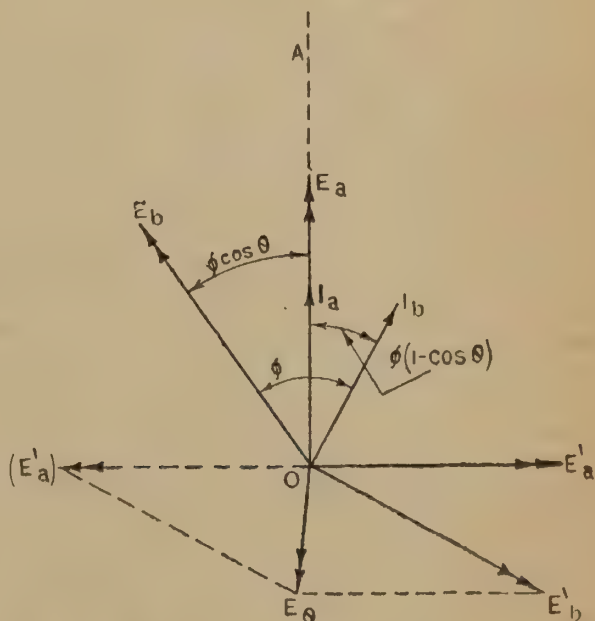


Fig. 13. Vector diagram for spaced open aerials with non-central summation of E.M.F.'s.

direction when direction finding. In order to achieve this result consider the arrangement in Fig. 12, in which the receiver is placed at the foot of the A aerial instead of mid-way between the aerials. Constructing a vector diagram, Fig. 13, let OA be the phase of the new centre of the system, or in other words, let us reckon time from the instant at which the wave reaches the A aerial. This will be the phase of the E.M.F. in A so we can draw E_a . The E.M.F. in B when θ is zero will lead on that in A by an amount ϕ owing to its spacing ϕ in the direction of incidence of the wave. The receiver is, however, at A and when the E.M.F. E_b has been impressed upon the pair of lines from the base of the B aerial to the receiver, the time taken for the current wave to travel to the receiver will be practically the same as that taken by the propagated electromagnetic wave to travel from the aerial B to the aerial A, the net result being that the two aerial current effects will reach the receiver together. By a simple circuit arrangement, these two currents can be made to induce E.M.F.'s E'_a and E'_b in the Receiver circuit, equal in amplitude and opposite in phase resulting in zero reception. For any other angle of incidence θ , the spacing of the aerials in the path of the wave will be $\phi \cos \theta$ so that the E.M.F. in B will lead on that in A by that amount whilst the time taken for the B effect to travel from B to A will still be the same as before, so that the net phase difference of the effects in the receiver will be $\phi \cos \theta - \phi$, or $\phi (\cos \theta - 1)$. Reversing one of the vectors and adding, we get the resultant E_θ , which is given by:—

$$\sqrt{2} E^2_v [1 - \cos \phi (\cos \theta - 1)]$$

and as before, for small values of ϕ , this simplifies down to:—

$$E_v \phi (\cos \theta - 1),$$

which when plotted gives the polar curve of Fig. 14.

Experience of ordinary alternating current practice seems to suggest an alternative method of obtaining the cardioid diagram without the necessity of locating the receiver at the foot of one of the spaced aerials. Consider the arrangement of Fig. 15 and the vector diagram of Fig. 16. The receiver is

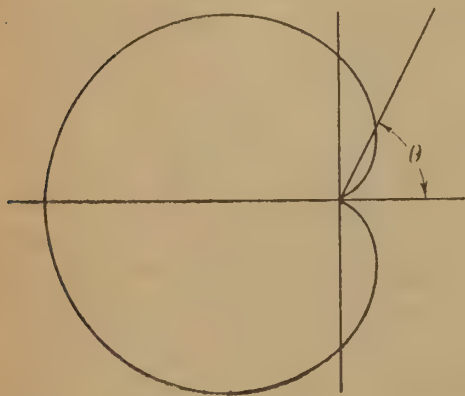


Fig. 14. Cardioid polar diagram.

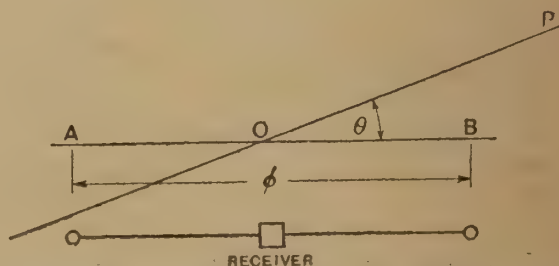


Fig. 15. Plan view of two spaced open aerials with central summation.

now at the centre of the system again so that when θ is 0 we have the E.M.F. in B leading $\phi/2$ on O, and the E.M.F. in A lagging $\phi/2$ on O, time being reckoned as before from the instant of arrival of the wave at O. The currents due to these E.M.F.'s will take equal times to reach the centre point so that on arrival they will still be out of phase by an amount ϕ . But, suppose that by the usual method of increasing the capacity reactance of the A aerial circuit, we make the A current "lead" $\phi/2$ on the E.M.F. in A and by decreasing the capacity reactance of the B aerial circuit we make

the B current lag $\phi/2$ on the E.M.F. in B, then for the general case, the vector diagram will be as shown in Fig. 16 and for $\theta = 0$ it will be as in Fig. 17, appearing to give a complete solution of the problem.

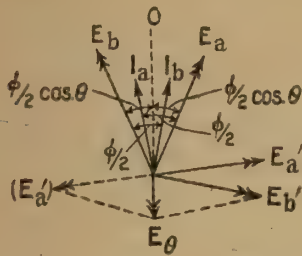


Fig. 16. - Vector diagram for spaced open aerials with mis-phasing of aerial currents.

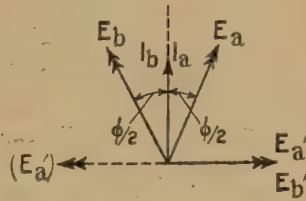


Fig. 17. Vector diagram as in Fig. 16, but for $\theta = 0$.

Consider, however, what this means in the case of the arrangement in Fig. 15. When the incident wave makes an angle $\theta = 180^\circ$, and is arriving in the direction AB, since the A aerial current has been arranged to lead $\phi/2$, the current will be flowing in the receiver as the wave reaches A. In other words, the effect of the wave will reach the receiver before the wave itself and must therefore travel with a velocity greater than that of light. Actual experiment shows, furthermore, that whilst it is a simple matter to obtain the cardioid diagram by means of the above expedient of leading and lagging currents in the aerials, the balance so obtained is only perfect for continuous or slightly damped oscillations, although with receiving circuits of low damping, the balance obtained on atmospherics is good enough for most practical purposes.

"LEADING CURRENT."

The misconception arises from the title "leading" current. When an alternating E.M.F. is applied to a circuit containing capacity reactance, several cycles elapse before the conditions in the circuit exhibit what is termed a leading current and these cycles are known as the "starting conditions" as distinct from the "steady state." In describing this latter condition we are not justified in saying that because an oscillogram of the E.M.F. and current conditions in the circuit gives the appearance that the current is leading the E.M.F. by a quarter of a cycle that therefore the current at any instant is definitely associated with the E.M.F. which will exist a moment later.

The same argument may be applied to the lagging current, for in this case also there is a starting condition during which the phase of the current and E.M.F. is in a transient state and the current does not settle down to a definite amount of lag until a number of cycles have elapsed.

Applying the above reasoning to the case of the propagated electromagnetic wave and an associated aerial and receiver, the fallacy becomes more clearly marked. When a continuous or slightly damped wave train is incident on an aerial, the conditions in the alternating current circuits composing the receiver will have time to reach their steady state and any circuit having inductive reactance will reach the condition termed lagging current and capacity reactance circuits will appear to have leading currents. Suppose now that a sudden pulse of current, such as that caused by a strong atmospheric, flows in the aerial circuit which has been tuned to give a leading current, we are surely not now correct in saying that the current is being produced by an E.M.F. pulse which is shortly going to be induced in the aerial by a flux which is still a considerable fraction of a wavelength from the system?

THE CARDIOID DIAGRAM USING COMBINED FRAME AND OPEN AERIALS.

When a frame aerial is being used to obtain the cardioid, the non-central method of summation is ruled out since in this case the E.M.F.'s in the vertical limbs are combined in the aerial loop itself, giving a cosine diagram. In order to produce the cardioid, it therefore becomes necessary to supply a further E.M.F. from a separate source and so to adjust the phase and amplitude of the currents that a balance is obtained in the receiver with consequent zero reception from a given direction. The usual combination is the frame and open aerial which are arranged so that the aerial currents induce E.M.F.'s in a common receiver circuit, the amplitude being adjusted, as shown in Fig. 18, where the circle diagram for the open aerial and the

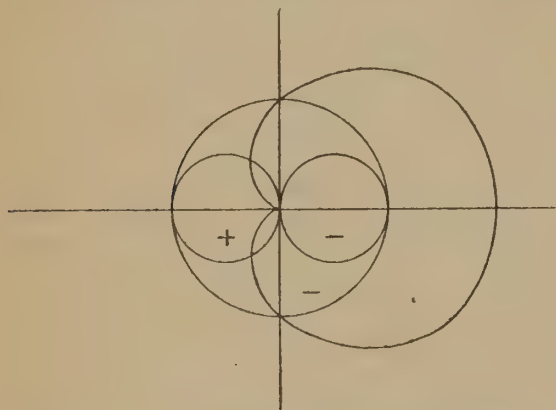


Fig. 18. Cardioid diagram produced by combination of circle and cosine diagrams.

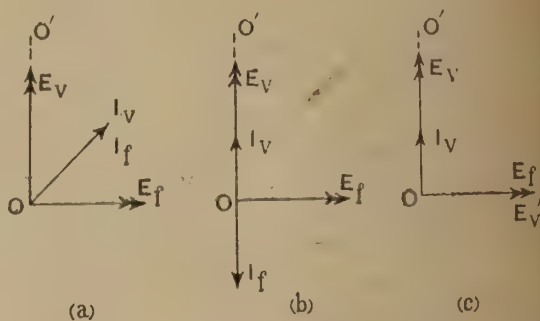


Fig. 19. Vector diagrams of three methods of obtaining correct phase relation of currents in frame and open aerial for production of cardioid.

maximum ordinate of the cosine diagram are equal and the algebraic sum of the two gives the cardioid. Since the E.M.F. in the frame has been seen to lag 90° on the flux in the wave, whilst the open aerial E.M.F. is in phase with the flux in the wave, the vector diagram for the circuit is as in Fig. 19 where OO' represents the flux in the wave and E_v and E_f the open and frame aerial E.M.F.'s

PHASE ADJUSTMENT OF AERIAL CIRCUITS.

Three methods are in common use for obtaining the correct phase relation of the aerial currents, namely:—

- (a) By arranging for a 45° leading current in the frame and a 45° lagging current in the open aerial, by mis-tuning the aerial circuits. This will produce current vectors as in Fig. 19a.
- (b) By the method of "resistance-phasing" of the open aerial which is employed in conjunction with aperiodic frames. In this scheme, at the point of zero reception, the current in the frame lags 90° on the frame E.M.F. and hence 180° on the flux in the wave whilst the current in the open aerial is maintained in phase with its E.M.F. throughout, by the large resistance in the circuit which swamps the inductive and capacity reactance. The two currents, and hence the two E.M.F.'s induced in the receiver circuit are thus in exact phase opposition when the conditions have reached the steady state and the current vectors are illustrated in Fig. 19b. Actually this method does not produce a true cardioid as I_f lags 90° on E_f only at the point of zero reception but still it has a number of advantages in practice and is described in greater detail, as applied to the Marconi-Bellini-Tosi system, in the present writer's book* on Direction Finding.

* "Direction and Position Finding by Wireless," By R. Keen. (Wireless Press).

- (c) By the use of a "resistance phased" open aerial coupled direct to the frame, instead of the two aerials being coupled to a common circuit. By this means the open aerial current is maintained in phase with E_v and induces an E.M.F. E'_v in the frame which lags 90° on E_v and is hence in phase with E_f as in Fig. 19c.

THE THREE DIMENSIONAL CARDIOID POLAR DIAGRAM.

The consideration of the various possible means of getting the correct phasing is not important as we are concerned at the moment with the directional properties of the aerials rather than the circuit problems involved, but in the discussion of the solid cardioid it is convenient to make use of the fact that the plane cardioid may be obtained in this way by the combination of the frame and open aerials.

The E.M.F. in an open aerial has been seen to be independent of θ the azimuth angle and to vary as $\cos \alpha$ where α is the zenith angle of incidence. Conversely the frame E.M.F. is independent of α and varies as $\cos \theta$. The general equation of the three dimensional cardioid may therefore be written:—

$$E_{\theta, \alpha} = E_v (\cos \theta - \cos \alpha)$$

where E_v is the maximum value of the frame or open aerial E.M.F. The negative sign is used in order to make $E_{\theta, \alpha} = 0$ for $\theta = 0^\circ$ and $\alpha = 0^\circ$. This expression when plotted out for every ten degrees of azimuth, as before, gives the solid diagram a model of which is illustrated in Fig. 20.



Fig. 20. Three dimensional polar diagram of reception of normally polarised waves by aerial system having cardioid reception in horizontal plane.

NIGHT EFFECT AND THE CARDIOID DIAGRAM OF RECEPTION.

Observations made during periods of night effect, using the cardioid diagram of reception, show that very rarely are signals received from the station under observation once the circuit has been adjusted and the minimum set to the correct direction for zero reception, even though there is evidence that waves are arriving with an appreciable vertical angle of incidence. A glance at Fig. 20 and 21 will explain this for it will be seen that if a normally polarised wave from a station in the direction $X'O$ assumes a 30° vertical angle of incidence PO in the vertical plane through XOX' , the reception as indicated by the ordinate Op will still be less than 7 per cent. of the maximum reception in the direction XO . On the other hand, any component of the wave which is incident in the vertical plane XOX' and which has its magnetic field polarised vertically can never affect the cardioid circuit

at all since there can be no linkage of the magnetic flux with any aerial conductor. The simplicity of the circuit for the elimination of the interference from a jamming station or reduction of directional atmospherics and its

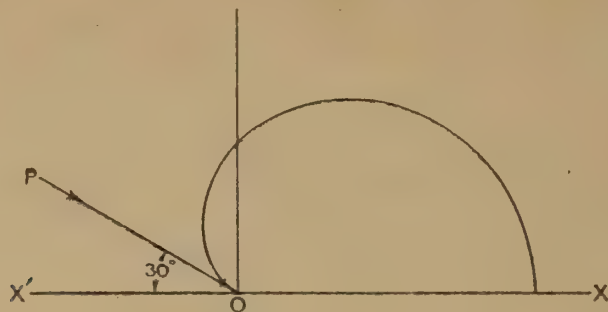


Fig. 21. Section through Fig. 20 showing polar diagram of reception in vertical plane through direction of minimum of cardioid.

comparative immunity from night effect have resulted in it becoming very popular on commercial traffic services.

SPACED FRAME AERIALS. CENTRAL SUMMATION.

In Fig. 22 are shown two frame aerials spaced ϕ apart and with their planes in the vertical plane through XOX'. Just as in the previous case of spaced open aerials, a wave incident along the direction PO will reach the B aerial earlier and the A aerial later than it does the mid-point O of the system. Furthermore, the resultant E.M.F.'s round the frames will each

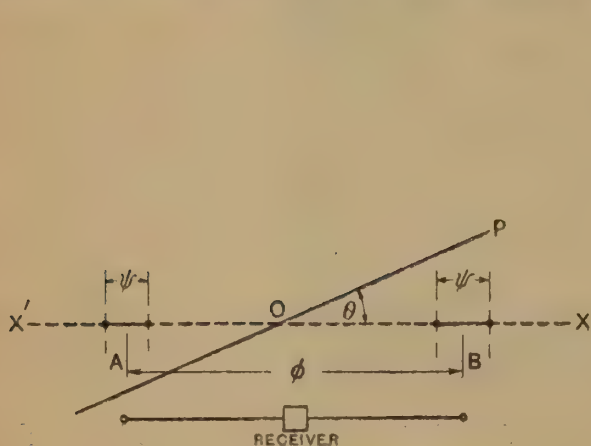


Fig. 22. Plan view of two spaced frames with central summation.

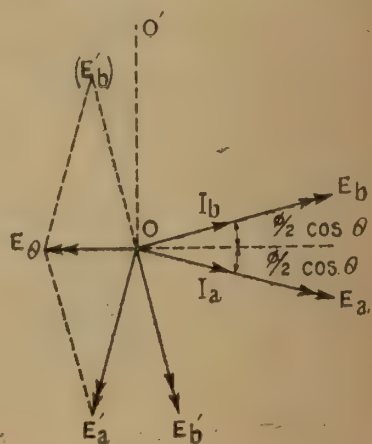


Fig. 23. Vector diagram for spaced frames with central summation.

lag 90° on the flux in the wave so that the resulting E.M.F.'s will lag respectively $(90^\circ - \phi/2 \cos \theta)$ and $(90^\circ + \phi/2 \cos \theta)$ on the centre point O. It must also be remembered that in addition to the directional effect due to the spacing of the frames, the E.M.F. in each frame is itself dependent on the angle of incidence and the dimensions of the frame. Thus, for any angle θ , and width of frame ψ , the E.M.F. in each frame is $E_r \psi \cos \theta$ so that the vector diagram for the central summation of the two frames is as in Fig. 23, where:—

OO' is the phase of the flux in the wave

E_b is the E.M.F. in B, lagging $(90^\circ - \phi/2 \cos \theta)$ on OO'

E_a is the E.M.F. in A, lagging $(90^\circ + \phi/2 \cos \theta)$ on OO'

I_b and I_a are the aerial currents

E'_b and E'_a are the E.M.F.'s induced in the receiver circuit

E_θ is the resultant of E'_a and E'_b reversed and is given by :—

$$\sqrt{2 E_r^2 \psi^2 \cos^2 \theta - 2 E_r^2 \psi^2 \cos^2 \theta [\cos (\phi \cos \theta)]}$$

$$= E_r^2 \psi \cos \theta \sqrt{2 [1 - \cos (\phi \cos \theta)]}.$$

Curves are shown in Fig. 24 for various values of spacing from $\phi = \lambda$ to $\phi = \lambda/16$.

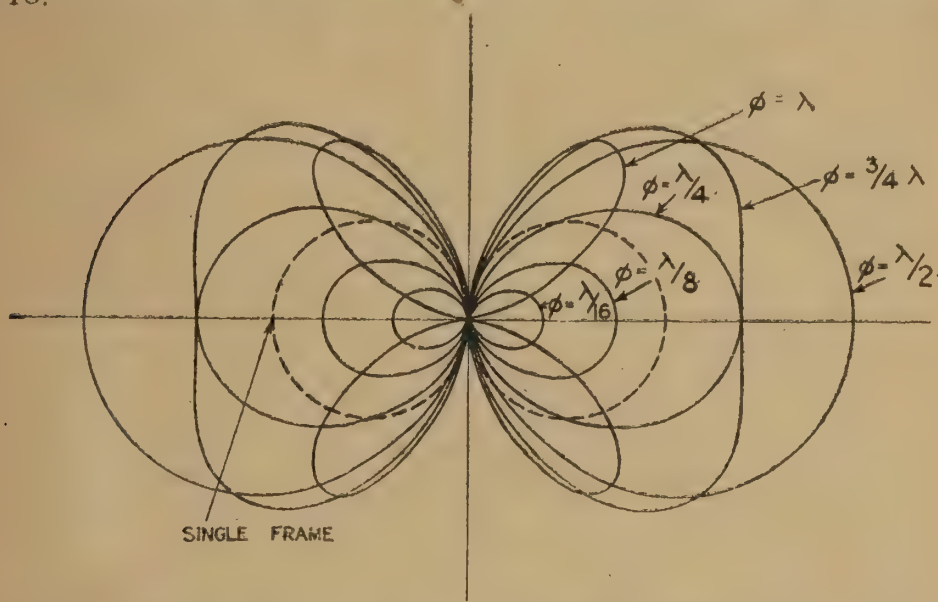


Fig. 24. Polar diagrams of reception for two frames with central summation and various spacings.

SPACED FRAME AERIALS. NON-CENTRAL SUMMATION.

Now consider the case when the current due to the E.M.F. in the B frame is arranged to lag by an amount ϕ on the E.M.F., summation being carried out at the base of the A aerial as shown in Fig. 25. For $\theta = 0^\circ$,

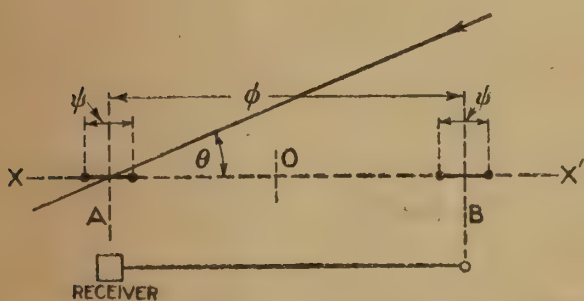


Fig. 25. Plan view of two spaced frames with non-central summation.

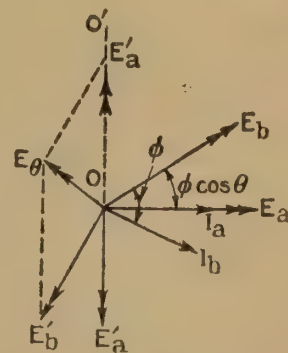


Fig. 26. Vector diagram for spaced frames with non-central summation.

the conditions will now give a zero balance when the circuit is adjusted so that the E.M.F.s are in opposition and the general case is illustrated in the vector diagram of Fig. 26 where :—

OO' is the phase of the flux in the wave at O .

E_b is the E.M.F. in B, lagging $(90^\circ - \phi \cos \theta)$ on O .

E_a is the E.M.F. in A, lagging 90° on O .

I_b is the current in B, lagging ϕ on E_b .

I_a is the current in A, in phase with E_a .

E'_b and E'_a are the E.M.F.s induced in the receiver circuit.

E_θ is the resultant of E'_b and E'_a reversed.

The net phase difference between E'_b and E'_a is therefore $\phi (\cos \theta - 1)$ and the resultant E_θ is given by:—

$$E_\theta = \psi \cos \phi \sqrt{2 [1 - \cos \phi (\cos \theta - 1)]}.$$

Fig. 27 shows the polar diagrams for such systems with spacings varying from $\phi = \lambda$ to $\phi = \lambda/16$. In each case it will be seen that there are at least

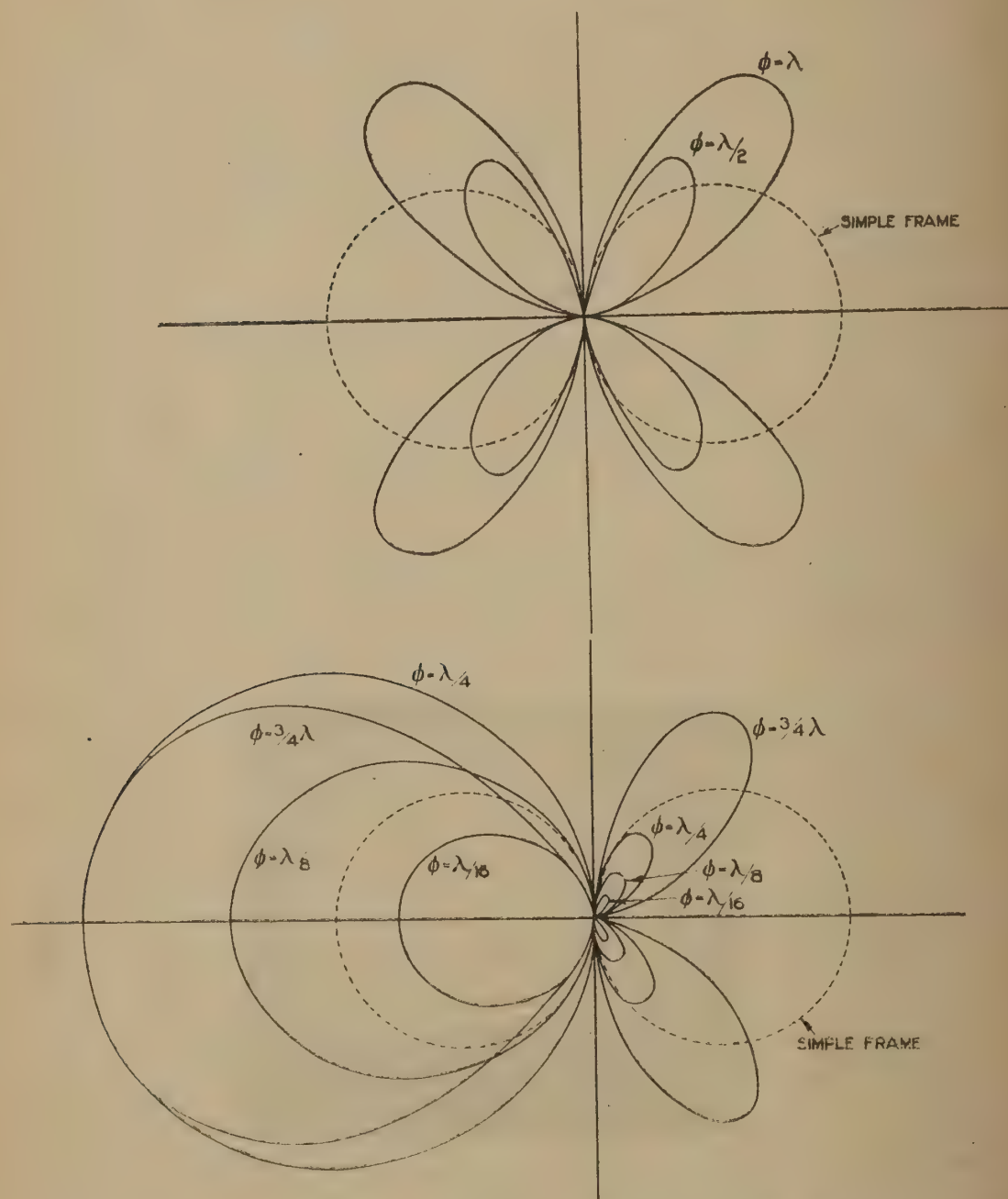


Fig. 27. Polar diagrams of reception for two frames with non-central summation and various spacings.

three directions of zero reception, namely, for $\theta = 0$ which coincides with the balance point, $\theta = 90^\circ$ and $\theta = 270^\circ$ which coincide with the directions in which the individual frames have no reception.

THREE DIMENSIONAL POLAR DIAGRAM FOR SPACED FRAMES WITH NON-CENTRAL SUMMATION.

Fig. 28 shows two frames spaced ϕ apart as in the case just considered, The point of summation is at A and PA is the direction of the incident wave

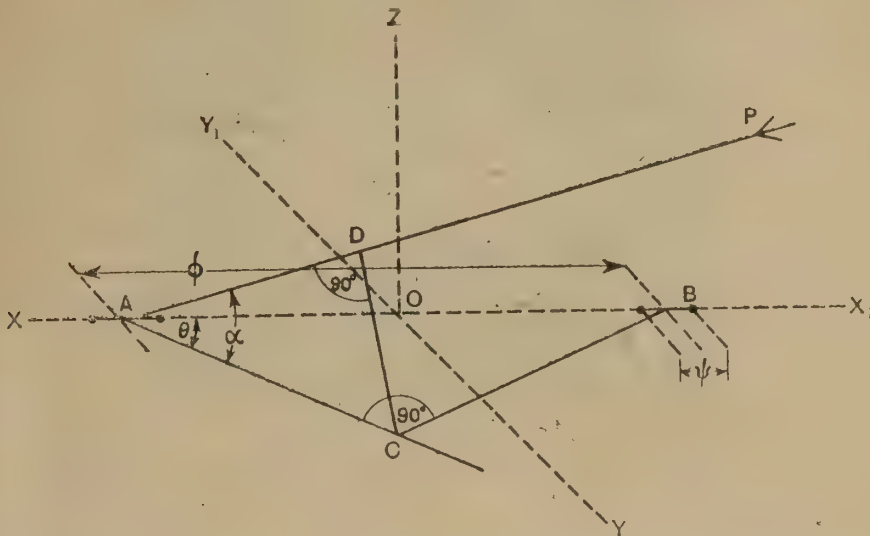


Fig. 28. Perspective diagrammatic view of two spaced frames with non-central summation, showing effective spacing for wave with vertical angle of incidence α .

having an azimuth angle θ and a zenith angle α . The spacing of the frames is now not AC, or $\phi \cos \theta$, but the projection of the actual spacing ϕ on PA namely AD or $\phi \cos \theta \cos \alpha$. Taking into account the B current lag of ϕ ,

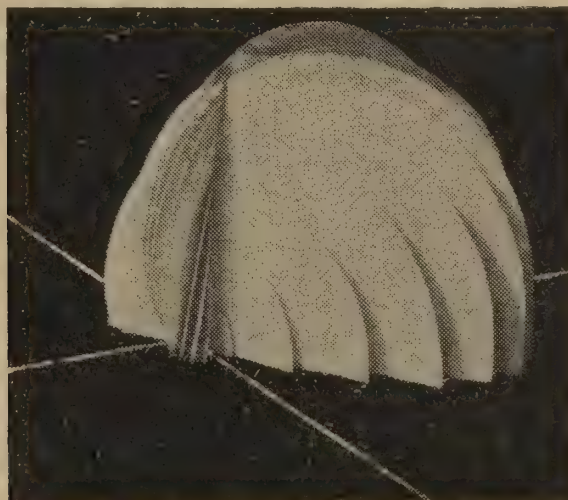


Fig. 29. Three dimensional polar diagram of reception of normally polarised waves by two frames spaced a quarter of a wavelength and with non-central summation.

we get a value for the net phase difference between the currents equal to $\phi (\cos \theta \cos \alpha - 1)$ and the general equation becomes :—

$$E_{\theta, \alpha} = \sqrt{E_r^2 \psi^2 \cos^2 \theta + E_r^2 \psi^2 \cos^2 \theta - 2E_r^2 \psi^2 \cos^2 [\cos (\phi \cos [\theta \cos \alpha - 1])]} \\ = \sqrt{2} E_r \psi \cos \theta \sqrt{1 - \cos [\phi (\cos \theta \cos \alpha - 1)]}$$



Fig. 30. As Fig. 29, but for spacing of an eighth of a wavelength.

which when plotted for values of $\phi = \lambda/4$ and $\phi = \lambda/8$ gives the solid diagrams of Fig. 29 and 30.

VALVE PATENTS FOR 1923.

By I. SHOENBERG.

British No. **162,288**. By GESELLSCHAFT FUR DRAHTLOSE TELEGRAPHIE M.B.H.

It is well known that the current flowing through a wire of chemically pure iron (usually placed in an atmosphere of hydrogen) remains more or less constant even if the E.M.F. varies within certain limits. It follows that if an iron wire is placed in series with the filament of a valve the current in the latter will remain constant in spite of voltage variations in the source employed for heating the filament. In certain cases, however, such a high degree of constancy is required that the simple arrangement just mentioned is not sufficient.

The specification describes a method which allows of maintaining the filament current constant to any degree that may be desired. On the drawing (Fig. 1) the method is illustrated as applied to a valve generator supplying an antenna. 1 and 2 are the terminals of the source employed for heating the filament, 4 and 5 are iron wire resistances shown enclosed in tubes filled with hydrogen, 3 is a constant resistance. Assume that the resistance of the filament is approximately equal to that of 5 and that the resistances 3 and 4 are also approximately equal. A variation of 10 per cent. in the P.D. between 1 and 2 will then, as experiment shows, lead to a variation of about 1 per cent. in the P.D. between the terminals of 3. Reasoning in the same manner with respect to 5 and 6, we shall find that the final variations of the potential drop across the filament 6 will amount to about 1/10 per cent. It is easily seen that by increasing the number of stages in the cascade the filament current can be maintained with any degree of constancy that may be necessary.

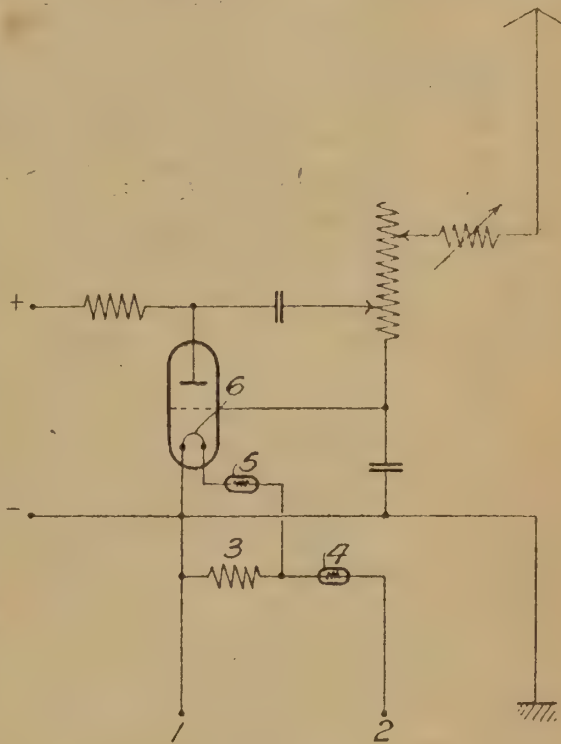


Fig. 1.

British No. **164,009**. By M. LATOUR.

The invention relates to the arrangement of the circuit of a generating valve mainly for transmitting purposes. As will be seen from Fig. 2, the anode and grid inductances L and T respectively are combined in one coil, while the connection to the filament is taken from a sliding tap K. The signalling key T is placed in the filament lead. The advantages claimed for this arrangement are as follows:—

(1) Variations in the wavelength of the radiated waves are made by the sliding contact K. The movement of the contact, however, will adjust not only the wavelength but will also at the same time establish

the correct ratio between L and T for efficient working, since T is decreased with the increase of L and *vice versa*.

- (2) The key is so placed that the anode and grid circuits are closed and interrupted simultaneously. This is more advantageous than the usual method of keying, in which the grid circuit only is interrupted while the anode circuit is always kept closed thus involving the inconvenience of the generating valve always remaining under load.

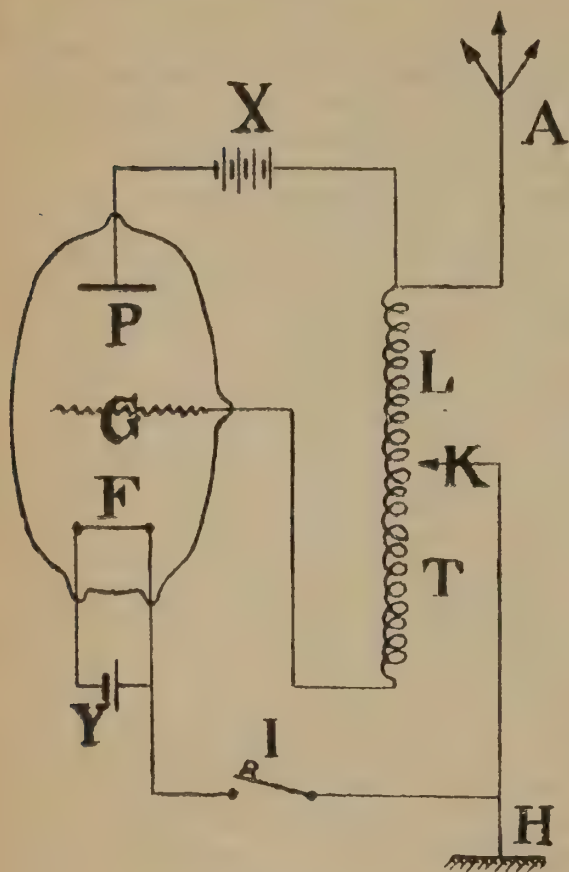


Fig. 2.

ferably material pervious to ultraviolet light, and into which are sealed in the usual manner, an electron emitting cathode 2, a co-operating anode 3 and a discharge-controlling grid 4 usually located between the cathode and anode. The cathode in this case consists of potassium, sodium or other metal which emits electrons when illuminated by means of a source of light 5 which may be an incandescent lamp as illustrated or other suitable arc lamp. A monochromatic source of light such as a mercury vapour arc in a quartz or glass envelope is advantageous in giving electrons of uniform velocity.

The anode preferably consists of tungsten and is deprived of gas by electron bombardment during the exhausting process, the envelope being sealed when the anode has been thoroughly freed from gas and the pressure in the envelope has been reduced to a value at which no appreciable gas ionization can occur. The grid 4 and the cathode 2 are connected respectively by conductors 6 and 7 to the secondary winding of the transformer 8, the primary winding of which is connected in series with the antenna 9. In the antenna circuit there may be connected an earthed condenser 10 and the structure and connections of the antenna may be any usual ones not forming a part of the present invention. A source of potential 11 is preferably included in the grid circuit 6, 7. This source may be a battery which preferably is

British No. **168,893**. By THE B.T.H. Co., LTD., and I. LANGMUIR.

The invention described in the specification, the connection of amplifying valves in cascade by means of resistance coupling, has now become classical. The delay in publication (the Application bears the date October 29th, 1913) is due to the war.

We are giving below a description of the invention more or less in the words of the inventor himself (Dr. I. Langmuir), not only in view of the importance of the principle, but also for the sake of the interest which the specification possesses from the point of view of history.

"In this drawing (Fig. 3), an electron discharge device "A" comprises a gas-tight envelope 1, which may consist of quartz or glass, pre-

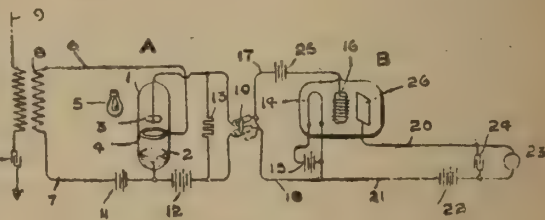


Fig. 3.

connected to maintain the grid at a definite negative potential, but in some cases the grid may be maintained at a positive potential."

"In the circuit connecting the cathode and anode, known as the 'plate circuit,' is connected a local source of energy such as a battery 12 having its negative terminals connected to the cathode and also an ohmic resistance 13. The grid consists of a frame-work upon which is wound preferably very fine wire, for example wire having a diameter of about 0.0004 inch, the turns being closely spaced. To the terminals of the resistance is connected a second electron discharge device "B" having a cathode 14 adapted to be heated to incandescence by means of a battery 15, or other convenient source. The grid 16 and cathode 14 are connected to the resistance 13 respectively by conductors 17 and 18, through a reversing switch 19. In the anode circuit 20, 21, of the device "B" is connected a local source of energy 22 and an electrical detecting device 23 such as any of the known forms of electro-magnetic recorders or a telephone. A condenser 24 may be connected in shunt with the detecting device 23. In some cases, a battery 25 or other source of potential may be included in the grid circuit 17."

"The discharge device "A" in which there may be relatively large distances between the grid and the two electrodes is made very sensitive to changes of the potential of the grid. The fact that the electrons are emitted by the cathode at uniform velocity contributes to its sensitiveness. A comparatively feeble impulse received in the antenna 9 will be accompanied by a change in the current from the local source 12 through the resistance 13. The current increases when a wave of positive potential is superimposed upon the negative potential of the grid. The current flowing through the resistance 13 will be greater than the current received from the antenna 9 and therefore will produce greater variations in the static charge of the grid 16 of the electron discharge device "B" than were originally received by the grid 4 of the device "A". Hence these potential changes may be used to produce greatly amplified signal currents; in other words, the stronger currents flowing in the plate circuit of the device "A" can be used to vary the flow of electron discharge current between the cathode 14 and the anodes 26 of the electron discharge device "B" which is adapted to control a relatively greater amount of energy than the device "A," although not necessarily so sensitive to minute changes of voltage as the device "A." When the switch 19 is in the position to connect the positive terminal of the resistance 13 to the grid 17, containing means for making the grid 16 negative, an increase in plate current in the device "A" will produce an increase in the plate current of device "B." The converse is the case when the connections are reversed. The variations in the anode or plate circuit constitute further amplification of the original signal currents and may be made great enough to operate an electro-magnetic instrument 23 such as a telegraph relay or to indicate a signal in any other convenient way. In some cases an ordinary telephone may be connected to the terminals of the conductors 20, 21 to detect amplified signals."

British No. 169,546. By THE G. E. CO., LTD., and M. THOMPSON.

The present specification deals with the manufacture of valves in which high emission of electrons is obtained from a filament kept at a comparatively low temperature. It is well known that these "dull-emitters" as they are called, can be divided into two classes: (1) Coated filaments; (2) Thoriated filaments. The invention under consideration relates to the second class and has for its object to remove the manufacturing difficulties due to the sensitivity of thoriated filaments even to very minute traces of oxygen and oxygen compounds. On the filament becoming oxydised its emissivity falls off to a very considerable extent. In order to prevent the evolution of deleterious gases, it is proposed to employ a method of manufacture described in the claims which read as follows:—

(1) "The method of preparing an electron discharge device in which the electrodes are made of tungsten or other metal, which consists in coating an electrode or part of an electrode with a varnish which on baking and during exhaustion of the apparatus makes a definite change in the surface of the metal."

(2) "A method of preparing an electron-discharge device in which the electrodes are made of tungsten or other metal, as claimed in Claim 1, in which the varnish consists of a celluloid-amylacetate paste thinned out with a mixture of ether and methyl alcohol and may contain red phosphorus."

British No. **168,947**. By THE B.T.H. Co., Ltd. (Communication from the G.E.C. of America.)

Let, in Fig. 4, V represent the direction in which a particle carrying a charge e is moving with a velocity V under the influence say, of an electric field. If a magnetic field H is now produced the lines of which are at right angles to V , a force F will act on the charged particle. The magnitude of this force is HeV , where H is the magnetic force, and its direction is at right angles to both H and V . It follows that the path of the particle will be modified and become curvilinear.

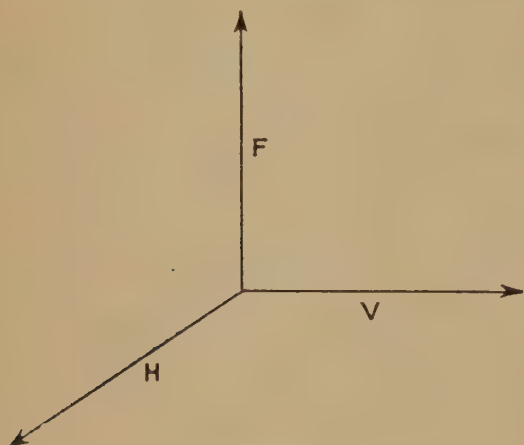


Fig. 4.

This general principle is utilized in the so-called "magnetron," which consists in its simplest form of a straight filament and cylindrical anode arranged around it as an axis. The cylindrical tube which contains the two electrodes is highly evacuated and surrounded by a coil, which on being excited by an electric current, produces a field the lines of

which are parallel to the filament. The functional relation between the anode current and the strength of the magnetic field is shown on Fig. 5. It will be noticed that of the magnetic field the plate current remains at first constant and then begins to fall rather rapidly. This behaviour of the plate current becomes perfectly clear if one bears in mind the influence of the magnetic field on the path of the electron explained at the beginning. Up to a certain strength of the magnetic field, the electrons, though not moving in a straight line but in spiral, still arrive at the plate, and the electronic current is very much the same as if there was no magnetic field. On increasing the field further the spiral path of some electrons becomes of such a curvature that they do not strike the plate. The current becomes therefore smaller. On the field being made still stronger, almost all the electrons miss the plate and the current is reduced to practically zero.

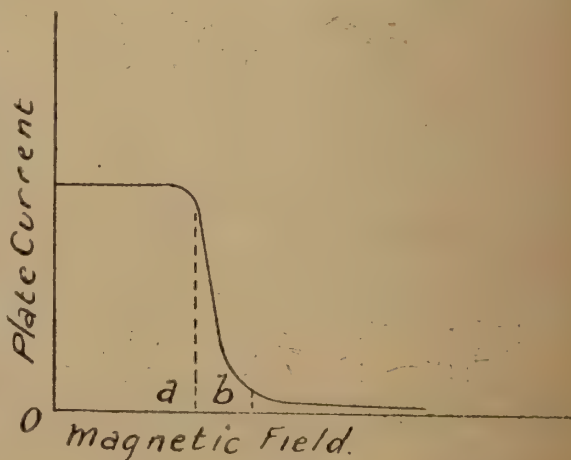


Fig. 5.

The present specification describes a method of employing the "magnetron" for generating H.F. oscillations. A suitable circuit is shown on Fig. 6. Here the container 1 with filament 2, heated by battery 4, anode 3 and magnetizing coil 9 which in practice is wound round 1, form the magnetron as described above.

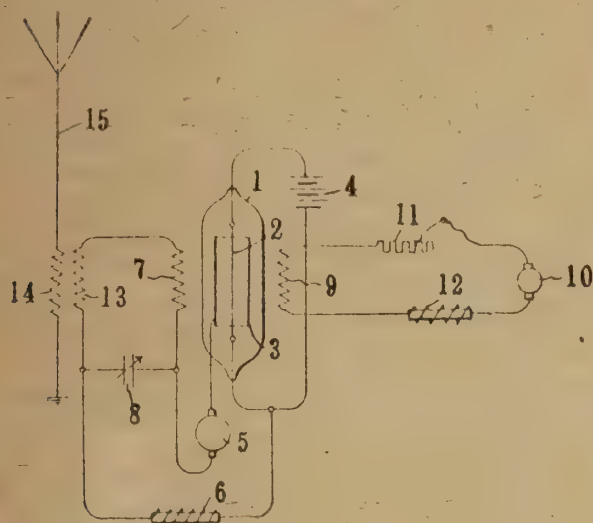


Fig. 6.

The constant magnetizing current is supplied by the D.C. source 10 through regulating resistance 11 and choke coil 12 which is inserted in order to prevent the H.F. oscillation from circulating in the excitation circuit. The D.C. source 5 is connected between the plate and filament through coil 7, which is wound in practice round 1, coil 13 coupled to antenna 15-14, and choke coil 6. Coils 13 and 7 are shunted by condenser 8. The wavelength will be determined by the constitution of circuit 7-8-13. The operation of the circuit is explained in the specification as follows:—

"The constant magnetic field may be adjusted to a value substantially equal to or somewhat greater than that represented by *Oa* in Fig. 5. The magnetising coil 7 may be so arranged and connected to a source 5 that the current flowing therethrough from this source will produce a magnetic field which adds to the constant magnetic field. Under these conditions when the circuits are complete, current will start to flow in the plate circuit but this current instead of coming up to the maximum value will only rise to a value intermediate the maximum and minimum values. In building up to this value at which the combined magnetic fields produced by coils 7 and 9 will prevent further increase of current, the condenser 8 will be charged. When the current in the plate circuit reaches a maximum value to which it can build up under these conditions the condenser 8 discharges through coil 7 producing a current in the opposite direction to that produced by the source 5. The magnetic field produced by this current will oppose the constant magnetic field and allow the building up again of current through the coil 7 from the source 5. The building up of this current will again produce a magnetic field which adds to that of the coil 9 and causes the current to decrease. The frequency of these changes of current will depend upon the natural period of the oscillating circuit which comprises the condenser 8 and coils 7 and 13. Current flowing in the plate circuit may be considered as a direct current having an alternating component superimposed thereon, this alternating component being the component which is effective in varying the magnetic field in the device, and hence varying the current in the plate circuit. This action is assisted by the impedance 6."

British No. **169,889**. By THE B. T.-H. Co., LTD. (A communication from the G. E. C. of America).

This specification relates to an improvement in connection with the "Magnetron." A glance at Fig. 5, which was described when dealing with No. 168,947, will show that the useful falling branch of the characteristic is reached only after a magnetic field of strength represented by abscissa *oa* has been applied. This premagnetization involves the use of a separate polarizing field which complicates the circuits in an undesirable manner.

According to the present invention this difficulty is removed by the utilization of the electronic current for polarizing purposes. As shown in

Fig. 7, source 5 is connected between the filament 2 and anode 3 of the magnetron through coils 6 and 7, which are actually wound round receptacle 1, and coil 8 coupled to antenna 12. Coil 13 which is inserted in the antenna

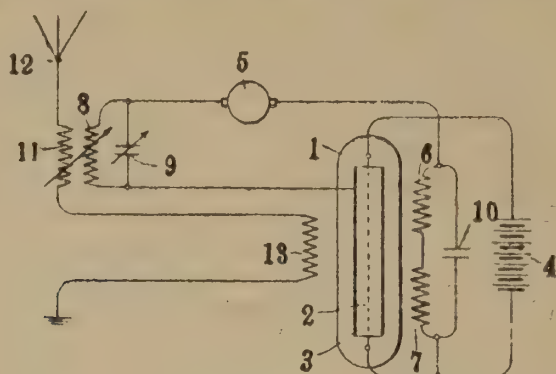


Fig. 7.

is also wound round 1. Coil 8 is shunted by condenser 9 and circuit 8-9 determines the wavelength. Coils 6 and 7 are shunted by condenser 10, which is large enough to by-pass the generated oscillations. On the other hand, the impedance of coils 6 and 7 is made sufficiently high to choke them off. Now the plate current can be considered as consisting of two components: (1) A D.C. of constant amplitude; (2) A superimposed A.C. It will be seen that with the arrangement described, the A.C. component will be by-passed through condenser 10, while the D.C. component will flow through coils 6 and 7 thus setting up the necessary polarizing field. For an explanation of the operation of the circuit in so far as the generation of H.F. currents is concerned, the reader is referred to British No. 168,947 described above.

British No. **170,834**. By THE B. T.-H. CO., LTD., and W. C. WHITE.

It is well known that before the advent of the so-called "hard" valves, "soft" valves were in common use. The latter type was characterised by the presence of residual gas. At a certain plate voltage, filament temperature and grid potential, such valves are very sensitive and the results that can be obtained with them, whether as detectors or amplifiers, are much superior to those obtainable with a hard valve. However, the "soft" valves were not constant in operation, *i.e.*, one could not be certain that results obtained once could be reproduced again under the same operating conditions as before. This erratic behaviour was due to variations in the pressure as well as in the constitution of the residual gas. On one hand, fresh quantities of gas were evolved from the electrodes and container when heated. On the other hand, certain constituents were absorbed or "cleaned up" as the phrase goes. Under these conditions the hard valve in which the quantity of residual gas is negligible with electrodes freed from gas by bombardment or otherwise was generally adopted in practice owing to the constancy of its operation, although its sensitiveness is inferior to that of the old valve.

According to the present invention a soft valve of great sensitiveness and constancy in operation can be manufactured in the following manner. First of all, steps are taken to obtain a very high vacuum exactly as in the manufacture of hard valves. For this purpose the bulb is subjected to a temperature (about 360°) and the electrodes are freed from gas by bombardment. A gas like argon, neon, etc. immune from "cleaning up" effects is then introduced. When the gas reaches a pressure of 15 to 75 microns the envelope is sealed. It will be seen that since neither evolution or absorption of gas can take place, such a valve will be constant in action. On Figs. 8 and 9 the characteristic of curves 27 and 29 of the new valve are shown

side by side with those (26 and 28) of a hard valve. It will be seen that the former are very much steeper than the latter.

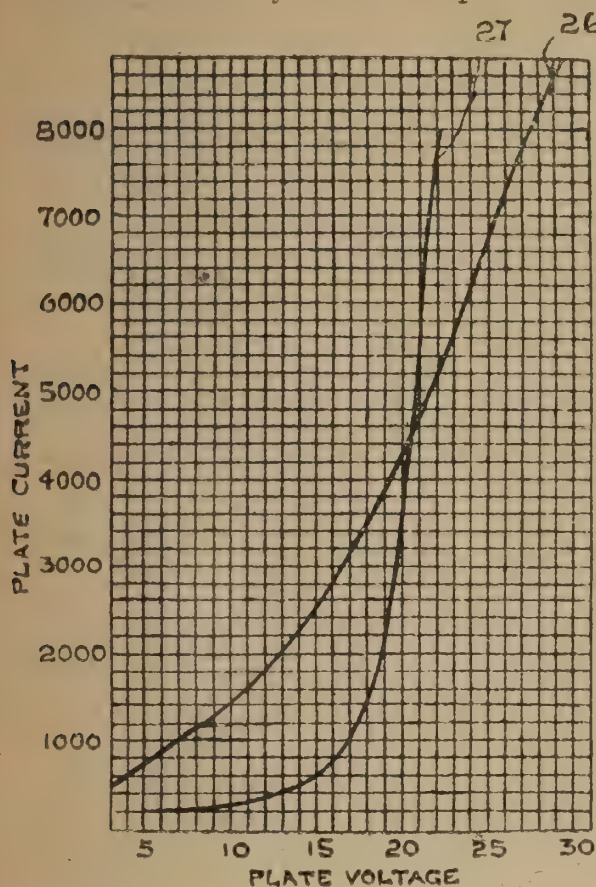


Fig. 8.

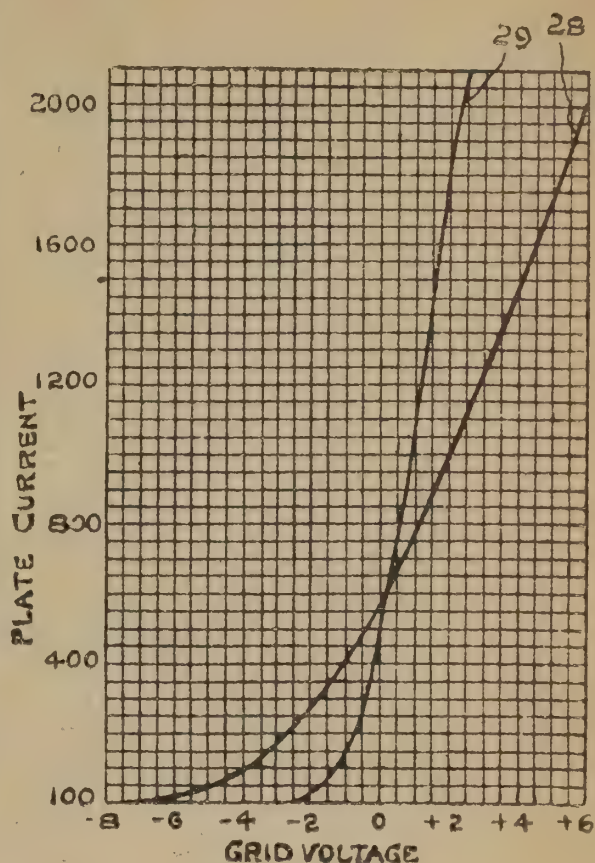


Fig. 9.

British No. 172,376. By J. SCOTT-TAGGART and RADIO COMMUNICATION Co., LTD.

The invention relates to a method of reducing interference from strong signals in reception by means of limiting devices in the form of Fleming valves. The idea underlying the invention will be best understood from a study of Fig. 10. Here, the secondary circuit $L_2 C_2$ coupled to the receiving

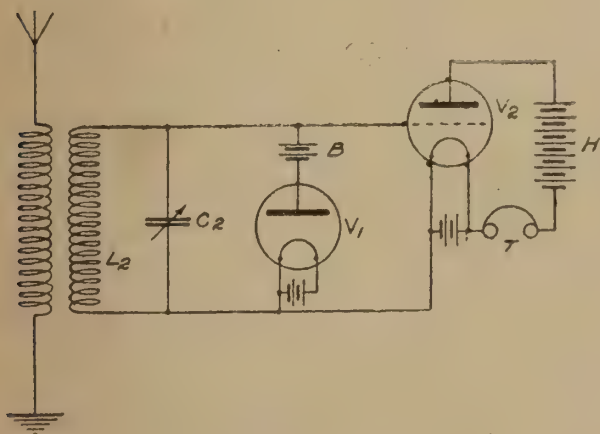


Fig. 10.

antenna is connected to the detecting valve V_2 in the ordinary manner. The grid-filament of V_2 is shunted by the Fleming valve V_1 and battery B which is connected with its negative terminal to plate of V_1 . Now, it is well known that the Fleming valve does not conduct unless the plate potential is positive relatively to the filament. Therefore, as long as the amplitude of the P.D. due to the received signals is less than the potential difference impressed by B between plate and filament of V_1 , the behaviour of the receiver will be

the same as if V_1 and B were absent. The weak signals which are to be received will not be affected. On the other hand, a strong interfering signal due to an atmospheric, for instance, will make, during the positive half cycles, the plate of V_1 positive and the result will be the same as if a resistance was connected between filament and grid of V_2 . The amplitude of the interfering signals will thus be reduced.

British No. 172,593. By THE B. T. H. CO., LTD. (A communication from the G. E. C. of America).

In connection with No. 168,947 the effect of a magnetic field at right angles to the path of the electrons was described. From the characteristic curve given on Fig. 5, it will be seen that by varying the strength of the magnetic field the electronic current can be reduced or even cut off altogether. This property is utilised in the present invention for modulating the H.F. current generated by a three-electrode valve.

In Fig. 11 a valve transmitter is shown with filamentary cathode 8,

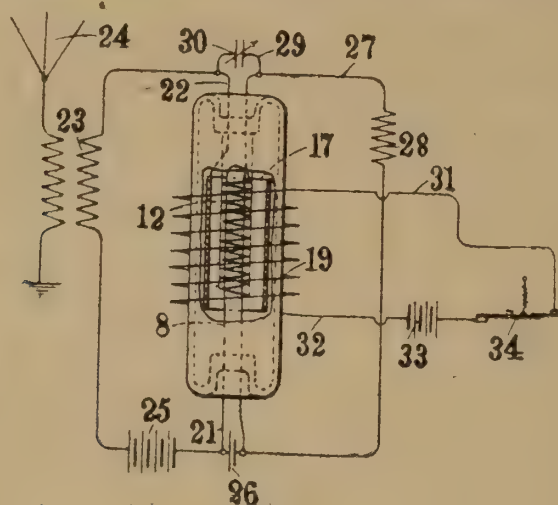


Fig. 11.

grid 12, and anode 17. The anode circuit 17-22-23-25-21-8 is coupled to the aerial 24. The grid circuit 12-27-28-8 is coupled to the anode circuit by means of the variable condenser 30. Owing to this coupling H.F. oscillations will be generated and radiated by the antenna. For signalling purposes the container of the triode is surrounded by the coil 19 which is connected to source 33 through a key 34. The magnetizing current is so adjusted that when the key is closed the H.F. current is either suppressed or reduced to a very low value. When the key is open, the magnetic field is removed and

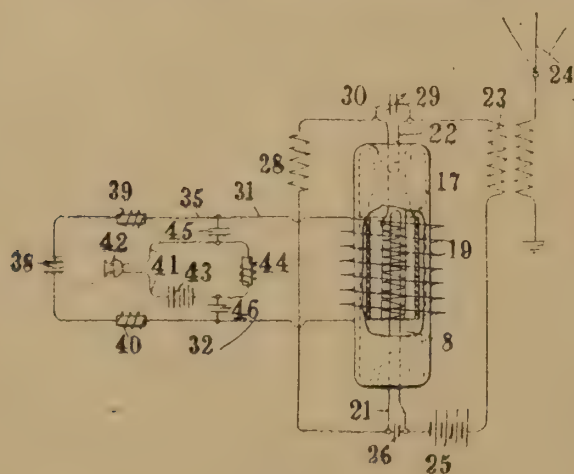


Fig. 12.

oscillations with the normal amplitude are generated. Fig. 12 shows the same method of control applied to wireless telephony. The key is substituted by microphone 42 and its circuit. The operation of this arrangement does not require any further explanation after what has been said above in connection with Fig. 11.

British No. 174,134. By J. SCOTT-TAGGART and RADIO COMMUNICATION COMPANY, LTD.

The invention relates to a method of obtaining a negative resistance effect by means of a "negatron" described by the same inventor in Patent Specification No. 166,260 (See "Year Book of Wireless Telegraphy" for 1922, p. 1284), combined with an ordinary triode.

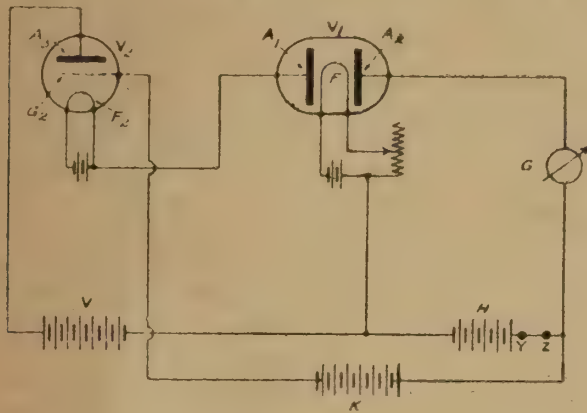


Fig. 13.

filament F and plate A_1 and V_2 — the potential drop between battery A_3 and F_2 . The relation between the momentary values of V_1 and V_2 is determined by the resistances at any moment of the paths $A_3 F_2$ and $A_1 F$. Now the internal resistance of the triode V_2 depends on the value of the grid potential. It follows, therefore, that with the variation of the grid potential the values of V_1 and V_2 will also vary, and since their sum is constant, an increase of V_1 will be accompanied by a corresponding decrease of V_2 and *vice versa*.

Bearing in mind these general explanations, let us now consider what will happen when a P.D. is applied between Y and Z in such a manner that the positive potential of A_2 is increased. In the first place there will be a tendency for the current flowing in the circuit $A_2 F H Y Z G A_2$ to increase. On the other hand, however, the potential of G_2 will become more positive. Owing to this, the internal resistance of V_2 will decrease and this will be accompanied by a decrease of potential across V_2 and by an increase of the positive potential applied to A_1 . The number of electrons attracted by A_1 will also be increased. Assuming that the emission is constant and equal at any moment to the sum of the number of electrons striking A_1 and A_2 , it follows that an increase in the number of electrons falling on A_1 must be accompanied by a corresponding decrease of the electrons falling on A_2 . In other words, the current flowing in A_2 will have a tendency to decrease. As the factor which causes an increase in the current of A_2 acts direct, while the effect of the other factor which causes a decrease in the same current is amplified by the triode V_2 , it can be arranged that the net result of the increase of the potential of A_2 should be a decrease in the current flowing from the same plate. The circuit of A_2 possesses, therefore, a falling characteristic which can be utilized in the well-known manner for generating or amplifying oscillations.

The method is illustrated on Fig. 13. Here V_1 is the negatron consisting of two anodes A_1 and A_2 and a filament F. The circuit of anode A_2 contains a battery H and galvanometer G. The circuit of anode A_1 is formed as follows: anode A_1 path between filament F_2 and plate A_3 of triode V_2 , battery V and filament F of negatron. At any moment we must have:

$$V = V_1 + V_2,$$

where V is the E.M.F. of battery V, V_1 the potential drop between

British No. 174,636. By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE m.b.H.

The use of rejector circuits for eliminating interference is well known. However, in order to make such a circuit efficient it is necessary that its resistance should be as small as possible. This means, since the losses in the air condenser usually employed are very small, that the inductance coil has to be designed very carefully. In order to keep its resistance very low one may have recourse to the well-known methods, as for instance, the employment of stranded wire, proper spacing of the turns, etc. The coil which will thus be obtained will, generally speaking, possess rather large

dimensions. This is not only inconvenient and costly but introduces the serious difficulty of the coil having a tendency to work as a frame aerial.

According to the present invention small coils may be used, while the losses are reduced by the use of a valve with grid and plate circuits having a certain amount of coupling in the same manner, for instance, as in the well-known type of receiver in which the reaction is applied to the tuned anode circuit. The following example is given in the specification.

"We will consider an inductance coil suitable for a rejector circuit of the wavelength 1,000 metres. Formerly such a coil was made of stranded wire composed of 270 wires each of about 0.07 millimetres diameter, each wire being individually insulated with enamel. The coil consisted of 78 turns in two layers, say, 90 millimetres long. Such a coil had about 500,000 centimetres inductance and was connected with a perfect air condenser of 800 to 1,000 centimetres."

"In place of such a bulky coil we can according to the invention use a coil formed of a single copper wire 0.2 millimetres in diameter, the length of the coil being from 1 to 1.5 millimetres, its internal diameter 10 millimetres and its external diameter 30 to 32 millimetres."

British No. 180,090. By WESTERN ELECTRIC CO., LTD.

The specification describes in considerable detail the process of manufacturing the so-called coated filaments for valves. The subject is of course of very considerable interest, since the coating of the filament with high electron emitting substances is one of the methods for reducing the consumption of current in the filament. Moreover, since copious emission takes place at comparatively low temperatures the life of the valve is considerably increased. The specification does not lend itself to abstracting and we limit ourselves to the necessarily dogmatic statements of fact as expressed in the Claims which read as follows:—

(1) "An electron emitting cathode wherein a metallic core is coated with a thermionically active material, characterised in this, that said metal core comprises a refractory metal of low volatility such as platinum or its equivalent and another metal such as nickel or its equivalent."

(2) "A cathode in accordance with Claim 1, characterised in this, that said core is formed of an alloy of 95 per cent. platinum and 5 per cent. nickel."

(3) "A method of making an electron-emitting cathode in accordance with Claim 1, characterised by causing a chemical reaction between said core and said coating material and then causing the compound thus formed to break down into its original constituents."

(4) "A method in accordance with Claim 3, wherein said coating contains alkaline earth metals such as the carbonates of barium and strontium, characterised by baking the coated core in the presence of oxygen for from five to twenty minutes at a temperature of approximately 1,200° C. to form a compound containing nickel and said alkaline earth metals and later baking the coated core in the absence of oxidising conditions, such as in a vacuum, at a temperature of approximately 1,000° C. for a period of several minutes to cause said compound to break down into nickel, oxygen and the oxides of the alkaline earth metals."

British No. 184,506. By B. T.-H. Co., LTD. (A communication from the G. E. C. of America).

The invention relates to magnetrons of the type in which the magnetic field is at right angles to the path of the electrons. As will be seen from Fig. 14, the device consists of a straight filament 2 heated by battery 5 through an adjustable resistance 6, a helical grid 3 kept at a positive potential by battery 7 and a cylindrical electrode 4 maintained at a negative or small positive potential by battery 8. The oscillations to be controlled by the magnetron are supplied to winding 9 and serve to produce the magnetic field. The main peculiarity of the arrangement consists in the low potential

of the plate as compared to that of the grid. Owing to this, the electrons start moving with a high velocity due to the high positive potential of the grid. When they pass the latter, however, their velocity gets reduced in consequence of the low plate potential. The possibility of secondary emission is thus eliminated. Moreover, as the specification states, these electrons with reduced velocity become "influenceable by a very weak magnetic field," which is a considerable advantage in comparison with the ordinary magnetrons,

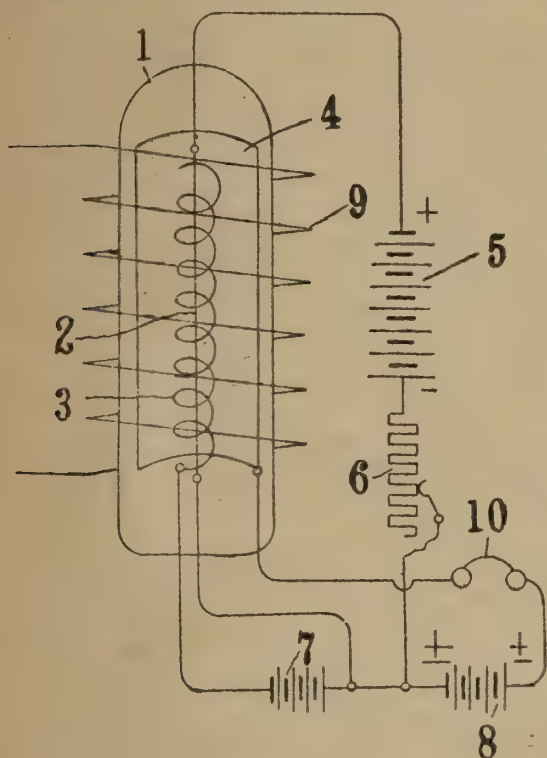


Fig. 14.

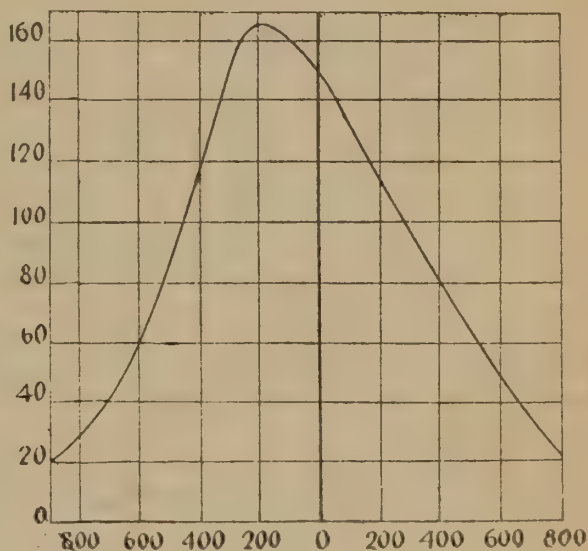


Fig. 15.

where rather strong magnetic fields are required. A characteristic of the device taken with a grid potential of $+40$ and with no battery in the plate circuit is shown on Fig. 15. The curve is plotted with the strength of the magnetic field as abscissæ and the plate currents as ordinates. It will be noted that the maximum plate current occurs not at zero field strength but at what is shown as a slightly negative value of the field. This is due to the fact that there is a certain field created by the current flowing in the filament, and this has to be balanced first by the field produced by the current flowing in 9. How this curve can be utilised for rectification and amplification will be clear without any further explanations.

British No. **184,875**. By B. T.-H. Co., LTD. (Communication from the G. E. C. of America).

In order to facilitate the understanding of the invention, it is necessary to say a few words about the "Dynatron." Consider a triode in which the grid is kept at a high positive potential. Let us now vary the potential of plate from zero upwards: At first, the plate current will increase, but at a certain value of the plate potential, however, when the velocity of the electrons becomes sufficiently large, their impact on the plate causes secondary electrons to be emitted. As the plate potential is lower than that of the grid they get attracted to the latter and a current will therefore be caused to flow by the secondary electrons in a direction opposite to the normal current due to the primary electrons. It follows that from this stage onwards the plate current will decrease: When the plate potential reaches a value at which the number of secondary electrons travelling to the grid equals the number of primary electrons striking the plate, the current is zero. A further increase

of the plate potential causes each of the primary electrons to split off from the plate more than one secondary electron, so that the secondary electronic current becomes larger than the primary one. That means that the plate current actually reverses. If we increase the plate potential still further, the secondary electrons begin to be prevented from travelling to the grid owing to the considerable attractive force exercised by the now highly positive plate. The current in the reverse direction begins to decrease and by continuing to increase the plate potential we reach a point when the current is again zero. If we make the potential of the plate still higher the balance of secondary and primary electrons will be as follows:—

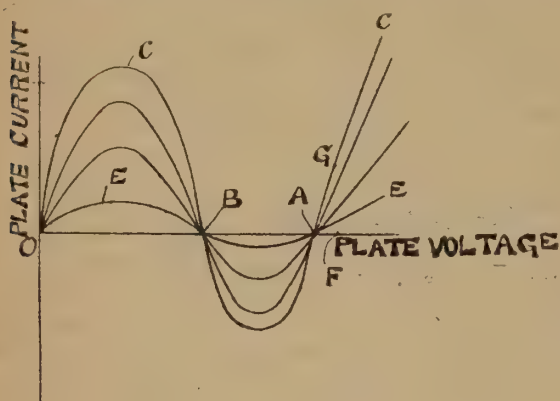


Fig. 16.

Although the number of secondary electrons struck off from the plate is now very high, only a few of them reach the grid; the most part gets attracted back to the plate. On the other hand, the primary electrons reach the plate in great numbers and with a considerable velocity. The result is an electronic current in the normal direction and this current will grow as the plate potential is further increased.

The plate current is represented graphically as a function of the plate voltage by any of the family of curves shown on Fig. 16. Take, for instance, curve C; from zero up to C the primary current increases, from C to B it falls and reaches zero at B. Between B and A the current is reversed and after a period of increase in the reverse direction there follows a period of decrease until the current becomes again zero at A. The branch AGC represents the increase of current in the original direction. It will be noticed that the branch CB and its continuation downwards is what is called a negative

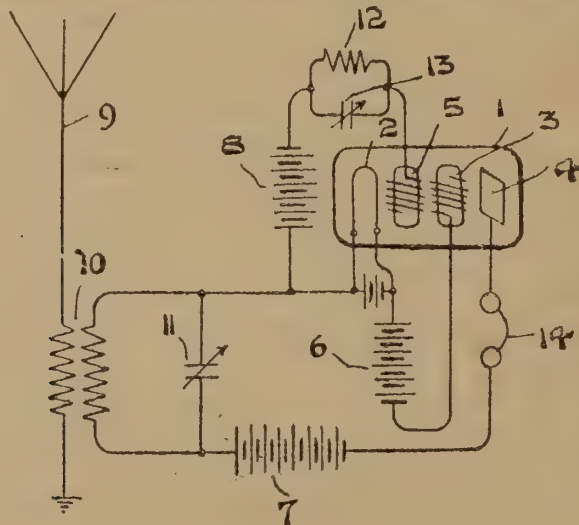


Fig. 17.

characteristic. We can predict from this that the "Dynatron" is capable of being used for generating oscillations in a circuit suitably connected to it for the same reasons as an arc.

Let us now introduce between the highly positive grid and filament of the dynatron another grid. If various potentials are impressed between this grid and the filament a different characteristic curve will be obtained for each grid potential, and a family of such curves is shown on Fig. 16. As the grid potential is decreased the maximum plate currents also decrease, but the points A and B remain common to all the family.

Bearing in mind the general theory of the four-electrode dynatron we shall now consider the arrangement forming the subject of the present invention. As shown in Fig. 17, the incoming oscillations from the antenna 9 are impressed through the secondary circuit 10-11 between the filament 2 and plate 4 of the dynatron. The batteries 7 and 6 are so chosen that the device is adjusted to point A, Fig. 16. The battery 8 impresses a positive potential on grid 5 of such a value that the subsidiary dynatron formed by the electrodes 2, 5 and 3 is adjusted to work on a point lying on that portion of its characteristic where it is negative. Owing to this there will be produced in circuit 12-13 oscillations of a frequency depending on the values of its capacity and inductance. The potential of grid 5 is thus made to vary, but as the main dynatron (filament 2, grid 3 and plate 4) is adjusted to point A, the plate current remains zero all the time. If, however, the potential due to the incoming oscillation adds to that impressed by 7, so that the total plate potential becomes OF a positive potential produced at the same time on grid 5 by the oscillations generated in circuit 12-13 will cause the plate current to vary from zero to quite a considerable value, as, for instance, FG. Now, if the incoming oscillations and those locally generated were of the same frequency and properly phased the operation of the arrangement would be equivalent to that of a rectifier. Assume that the grid and plate potentials vary in phase. When both are increased, the characteristic curve changes from E, say, to C, so that there is a considerable increase in the current for a small increase in the plate potential. When both are decreased the characteristic changes from E, say, to another possessing a still smaller maximum amplitude than that of E. Therefore the change of plate current in the opposite direction is very small. The net effect is that the original A.C. is converted into a series of positive pulses. If the grid and plate potentials varied in strictly opposite directions there would still be the rectifying effect, but pulses would be in the negative direction. However, keeping in constant phase relation two H.F. oscillations is by no means an easy matter. It is proposed, therefore, to adjust circuit 12-13 to a frequency slightly differing from that of the incoming oscillations. The phase will therefore vary with the result that at first there will be a series of, say, positive pulses with variable amplitudes, which will be followed by a similar series of negative pulses. Thus a beat current is produced in the telephone which will possess an audible component if the difference between the frequencies of the two oscillations has been properly chosen.

British No. 185,030. By WESTERN ELECTRIC CO., LTD.

The invention deals mainly with valves intended for handling comparatively high power. In such valves the anode gets fairly heated, and it is necessary, if damage to the tube is to be avoided, to dissipate the heat at a rate as high as possible. Another phenomenon which sometimes paralyses the operation of a valve is the so-called "blocking." This consists in the emission of secondary electrons from the grid owing to the impact of the electrons emitted in the ordinary manner from the filament. As the current due to secondary emission flows in a direction opposite to that of the normal current, the operation of the valve may be stopped. In order to remove these defects it is proposed to coat the electrodes in the manner clearly described in the Claims which read as follows:—

"(1) A thermionic device consisting of an anode cathode and grid control electrode spaced apart in an evacuated vessel, characterised in this, that one or more of said electrodes is provided with a coating of black nickel oxide adapted to increase the heat radiation from said electrodes."

"(2) A thermionic device comprising an anode, cathode and grid control electrode, and wherein one or more of said electrodes are composed of nickel, characterised in this, that said electrode or electrodes are coated with black nickel oxide produced by heating said electrode or electrodes

to a temperature of approximately 900°C . in the presence of air or oxygen."

"(3) A thermionic device consisting of an anode, cathode and a grid control electrode spaced apart in a evacuated vessel, characterised in this, that the grid control electrode is provided with a coating of a semi-insulating material adapted to suppress electron emission from said electrode."

"(4) A thermionic device according to Claim 3, characterised in this, that said coating consists of the oxide of the metal of which the grid is composed."

British No. **185,133**. By J. SCOTT-TAGGART and RADIO COMMUNICATION Co., LTD.

This specification describes a method of using valves for limiting purposes, the principle of which is illustrated on Fig. 18. Here IN and YZ denote the

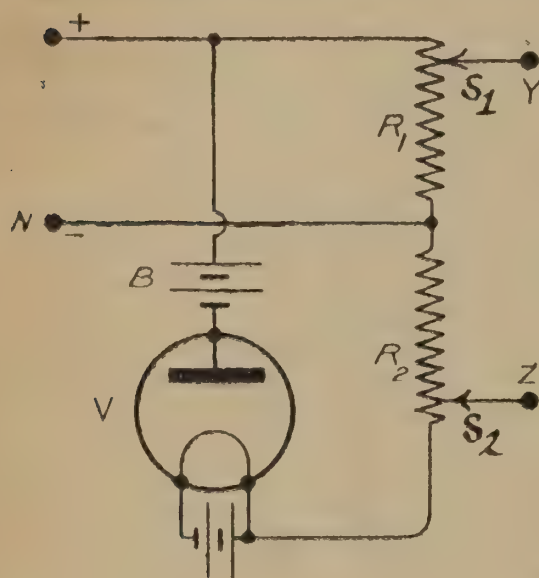


Fig. 18.

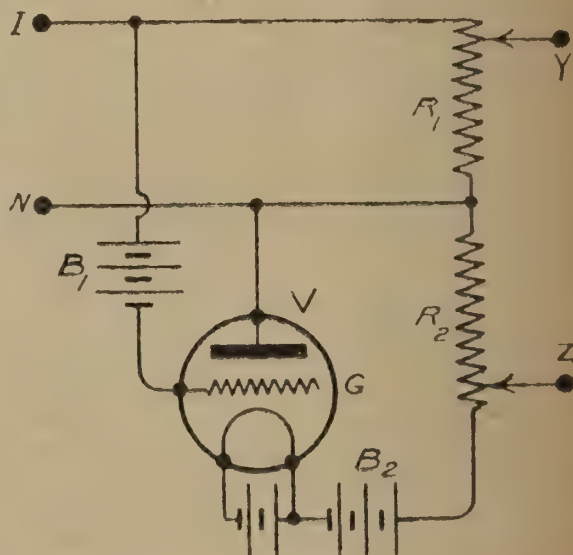


Fig. 19.

input and output terminals respectively, V is a diode and B is a battery with its negative terminal connected to the plate of V . Suppose a D.C. pulse is impressed between I and N . If the pulse is comparatively weak the diode remains non-conductive and the whole arrangement acts in the ordinary way, that is, as if the diode were absent. If the pulse is sufficiently strong, however, the potential of the plate may acquire such a value that the diode becomes conductive. In that case there will flow in R_1 a current in a direction from the top to the bottom. On the other hand, the current in R_2 (if circuit plate-filament $R_2 - R_1 - B$ be considered) will flow in the opposite direction. It follows that with the proper adjustment the output due to a strong impulse can be made to be no larger than that due to a weak impulse. On Fig. 19 a circuit is shown in which the diode is substituted by a triode.

British No. **185,252**. By THE B.T.H. Co., LTD. (A communication from the G.E.C. of America.)

The invention relates to high-power valves the container of which consists partly of glass and partly of metal, and has for its object to provide adequate means for cooling. In view of the importance which this kind of valve is likely to acquire we are giving the description in extenso.

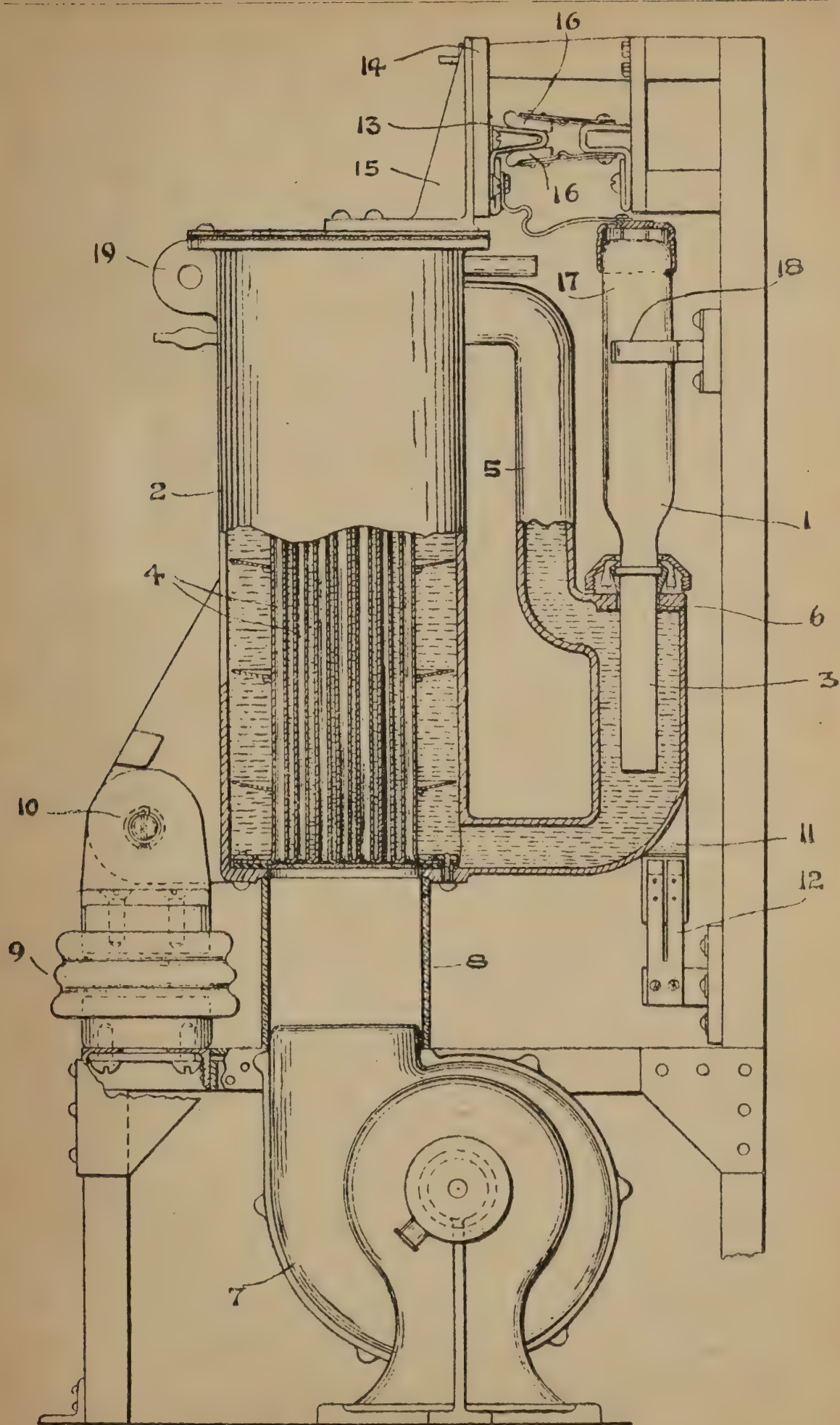


Fig. 20.

"As indicated in Fig. 20, the cooling means which we provide for the electron discharge device 1 comprises a container 2 for a cooling liquid which may be employed to cool the anode 3 of the device. The container 2 is provided with a large amount of radiating surface by means of a plurality of tubes 4 extending vertically therethrough. The pipe 5 connects the bottom of the container 2 with the top. The anode 3 of the electron discharge device is inserted in an opening 6 in the pipe 5, and a liquid-tight joint is made at this opening so that the liquid circulating in the pipe 5 cannot leak out around the anode 3. In the operation of the cooling means the liquid around the anode 3 is heated and rises through the pipe 5 to the top of the container 2. The liquid is then cooled in container 2 and circulates toward the bottom of the container and back through the pipe 5; thus a continuous natural circulation of the cooling liquid is provided. The cooling of the liquid in the container 2 is facilitated by causing a blast of air to flow through the pipes 4, this blast of air being furnished by the fan which directs the air through a conduit 8 of insulating material into the tubes 4."

"In the ordinary operation of the electron discharge device 1, the anode 3 is maintained at a high potential with respect to the other electrodes of the device and with respect to earth, and it is essential that the container 2 be insulated from earth. This is accomplished by mounting the container 2 upon an insulator 9 by means of a pivotal connection 10 so arranged that the container 2 may be rotated about the horizontal axis when it is desired to remove the device 1 from the pipe 5. This is desirable in order that the liquid in the container shall not leak out through the opening 6 when the device 1 is removed."

"In order to provide an electrical connection to the anode 3 a contact member 11 is secured to the pipe 5, and when the container is in its normal operating position this contact member 11 makes contact with stationary clips 12. When the container 2 is rotated to remove the device 1, this contact is automatically broken."

"A pair of contacts 13, of which only one is shown in the drawing, are mounted upon an insulating base 14 secured to bracket 15 on the top of the container 2. The contacts are connected to the terminals of the cathode of the device 1, and when the container 2 is in its normal operating position make contact with stationary contact members 16 to which the source of current supply for the cathode may be connected. When the container 2 is rotated to remove the device 1, the connections to the cathode are also automatically broken between contacts 13 and 16."

"The terminal for the grid electrode, which is not shown in the drawing, is usually brought out on one side of the portion 17 of the evacuated receptacle. A stationary contact member 18 may also be provided for making contact to the terminal of the grid electrode."

It will be noted that by the arrangement shown and described, the container 2 is insulated from all parts of the apparatus which are connected to earth, by means of the insulator 9 and the insulating conduit 8, and that connections to the electron discharge device must be broken before the device can be removed from the container. Any possibility of accident to the operator in removing the device 1 is therefore eliminated.

"The ear 19 with a hole therethrough which is formed on the container 2, permits of the rotation of the container about its axis by means of a hook with an insulated handle thereon."

British No. **185,384**. By B. T.-II. Co., LTD. (Assignees of E. F. Hennelly).

In "magnetrons," the coil which produces the controlling magnetic field is usually wound round the container. It is rather important to locate this coil as near the anode as possible, and the present invention provides a method of supporting the anode in accordance with this requirement. As

will be seen from Fig. 21, the diameter of the cylindrical anode 8 differs only little from that of the container 3. In the space between the anode and container are placed helices 11 and 12 of tungsten or other refractory metal.

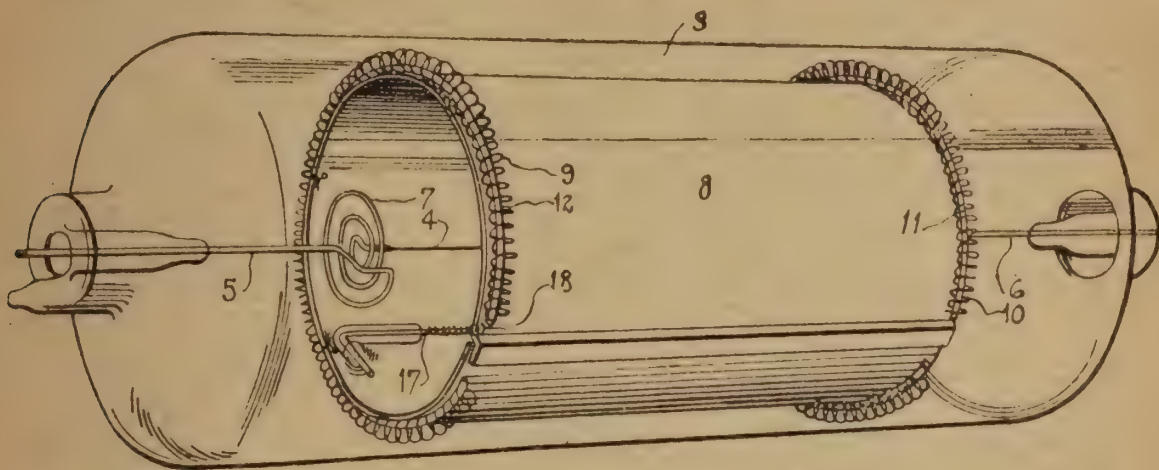


Fig. 21.

The anode is thus supported firmly and resiliently, being at the same time located very near the coil, which is wound concentrically with the container.

British No. 187,646. By H. J. ROUND.

It is well known that the characteristics of a two or three-electrode valve are curved even in those portions where they most approximate the straight line law. As the curvature in good valves is not large it can be neglected when the amplitude of the anode current is small. For large amplitudes, however, the effect of the curvature becomes quite noticeable and leads to very undesirable consequences. For instance, in low frequency amplifiers for wireless telephony, even if precautions are taken to avoid grid current, speech gets distorted owing to the fact that the curvature of the characteristic causes the amplitudes of the negative and positive half cycles to be unequal. Such asymmetry in the form of the wave involves the appearance of harmonics resulting in distorted speech or music.

When the valve is used as a generator of H.F. currents for transmission there will be radiated, for the same reason, harmonics, so that a station which is supposed to work on one definite wavelength really emits several waves and causes considerable interference. Examples of the disadvantages connected with the curvature of the valve characteristics could easily be multiplied and the present invention has for its object the provision of a method which allows of obtaining characteristics obeying the straight line law within wide limits.

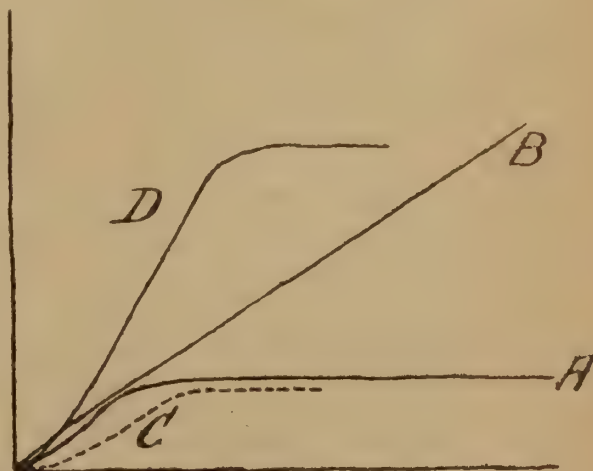


Fig. 22.

Take a diode with a characteristic similar to curve A shown on Fig. 22. In series with the anode introduce a resistance, the voltage-current characteristic of which is represented by the straight line B. Let us now construct the compound characteristic of the valve and resistance in series. We proceed

as follows (see Fig. 23). For a certain current i flowing both in the valve and the resistance the potential drop across the valve is V_1 and across the resistance V_2 . It follows that a point P of the combined characteristic will be determined by an abscissa $V_1 + V_2$ and an ordinate i . Repeating the process for several points we shall obtain as the resulting characteristic curve C (see Fig. 22) which possesses a portion approximating much more closely to a straight line than the corresponding portion of curve A . However, the slope of the new characteristic is not sufficiently steep. This can be remedied by taking several valves in parallel as shown on Fig. 24. Assuming the valves

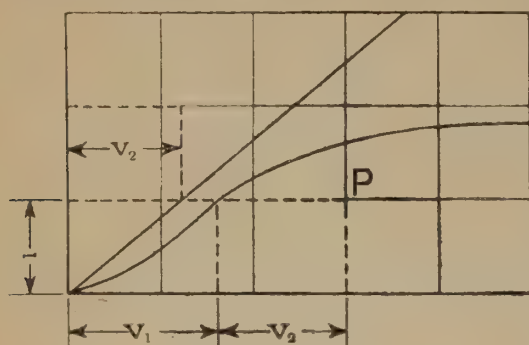


Fig. 23.

and resistances to be identical, the final characteristic for a three-valve can be obtained by multiplying the ordinates of C with 3 and its shape is represented on Fig. 22 by D .

It is obvious that the same method is applicable to triodes. The inventor makes the following statement:—

“Thus twelve valves each with a characteristic similar to that of a French standard receiving valve and with 150,000 ohms. in series with it may be arranged in parallel. The result is a characteristic which has about the same slope as the one valve at its best, but this slope is maintained with about one-twelfth the curvature for twelve times the length.”

British No. 189,095. By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H.

When valves are used for generating it is very important to keep the temperature of the anode comparatively low, say, not above a dull red glow. In practice, cases of a sudden overload on the valve occur, as for instance, when the aerial gets disconnected owing to an oversight perhaps. If the fault is not corrected immediately, the anode reaches such a temperature that it may melt.

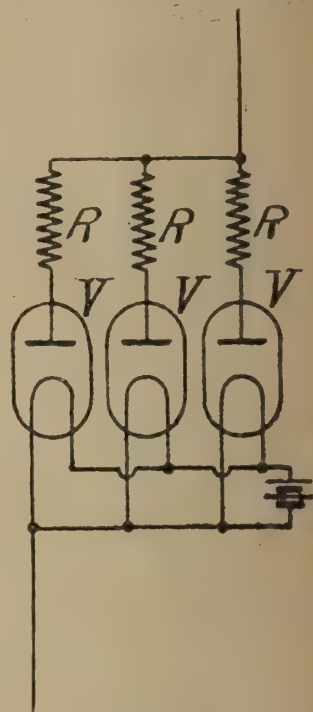


Fig. 24.

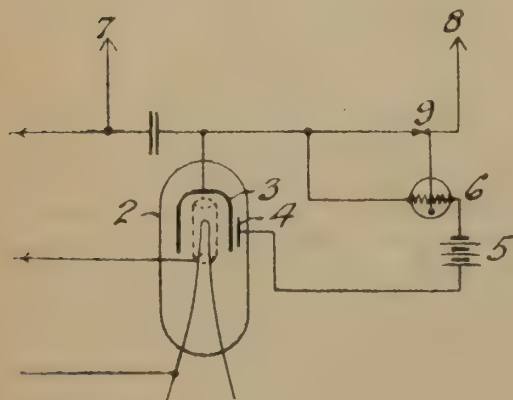


Fig. 25

It is proposed in the present specification to obviate the possibility of such accidents by providing a safety device which will act automatically. The invention is illustrated on Fig. 25. It will be seen that the valve 2 is provided, besides the ordinary filament grid and anode, with an additional electrode 4. The valve itself is connected in such a manner as to produce oscillations. The H.T. supply is connected to terminals 7 and 8, and the current has to pass through contact 9 of relay 6. When the temperature of anode 3 is normal the contact 9 is closed. When the valve is for some reason overloaded and the

anode gets sufficiently hot to emit electrons, they will be attracted to electrode 4, owing to the fact that the latter is kept at a positive potential by battery 5. A current will therefore flow through the winding of relay 6 with the result that contact 9 will be opened, the supply of H.T. will be broken, and the overload will be cut off in time to prevent valve 2 from being damaged.

British No. **189,645**. By L. B. TURNER.

Consider the arrangement shown on Fig. 26, which presents in a general form a triode with an input (grid) and output (plate) circuits A and B (the

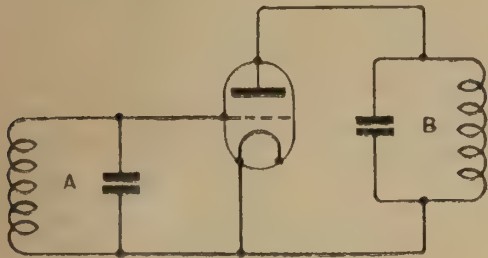


Fig. 26.

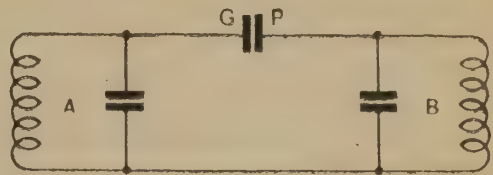


Fig. 27.

batteries are omitted). Even when the utmost care is taken to eliminate all traces of external coupling between these circuits, they still remain coupled through the plate-grid capacity of the valve, for it is easy to see that Fig. 26 is equivalent to Fig. 27, where GP is the condenser formed by the grid and plate. In order to get rid of this coupling the arrangement shown on Fig. 28 can be employed. It will be seen that the plate circuit contains two equal impedances D, E, to whose point of junction the filament is connected. Moreover a condenser C of a capacity equal to that formed by the grid and plate is inserted between the grid and one terminal of E. The effect of these modifications introduced into the arrangement shown on Fig. 26 becomes perfectly

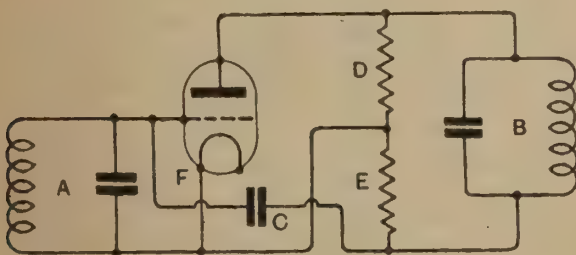


Fig. 28.

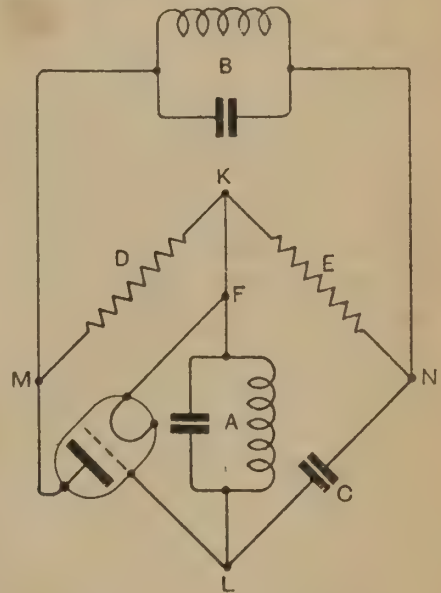


Fig. 29.

clear from a consideration of Fig. 29 which is exactly identical with Fig. 28. This redrawn form exhibits clearly the underlying idea. We have simply balanced out the capacity of the valve by means of a Wheatstone bridge. As the grid circuit is inserted in one diagonal of the bridge and the plate circuit in the other, it follows from general principles that as long as $D = E$ and $C = \text{capacity between grid and plate}$, any variations in the potential difference between points K and L will leave circuit B unaffected and vice versa. It is obvious that this applies only to the influence of one circuit upon the other due to coupling. In so far as the thermionic properties of the valve are concerned, they are not affected by our arrangement. For instance, oscillations induced in circuit A will be amplified or rectified in circuit B if proper steps are taken to obtain these effects.

The principle just explained is utilised according to the present invention for the purpose of minimising the disturbances due to atmospherics. The circuit shown on Fig. 30 is substantially the same as the one shown on Figs.

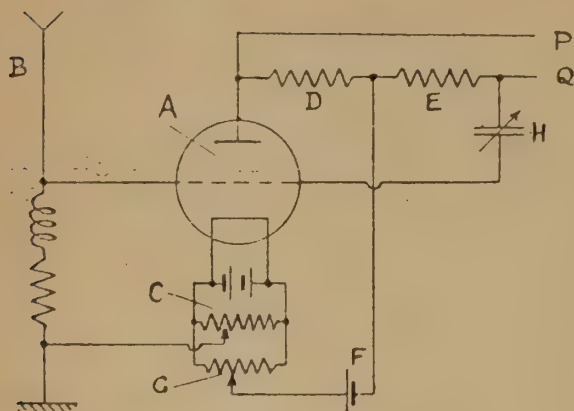


Fig. 30.

tude due to a strong atmospheric would be determined to a large extent by the degree of coupling and the limiting properties of the valve would be of little assistance. Hence the care taken to eliminate direct coupling.

In conclusion it should be pointed out that owing to the perfect symmetry of the circuits balancing will be obtained not only for steady conditions, but also for transients such as atmospherics.

British No. **192,673**. By G. HOLST and NAAMLÖÖZE VENNOOTSCHAP PHILIPS' GLOEILAMPENFABRIEKEN.

The invention relates to valves the container of which consists partly of metal and partly of glass. The construction of a high power valve is shown on Fig. 31. The hair-pin filament 13 is surrounded by a grid 18 made of metal gauze. The anode 10 forms part of the container and is made preferably of chrome-iron which possesses the property of fusing very well to glass. The container is completed by the glass portions 11 and 12 into which the leading-in wire for the grid and filament are sealed. It will be obvious that the anode being exposed and readily accessible, very efficient cooling can be easily provided so that high power outputs may be conveniently obtained from comparatively small tubes. The specification contains the following statement:—

"The composition of the chrome-iron should be such that its thermal coefficient of expansion is substantially the same as that of the glass to which it is to be fused. We have recognised however that the difference

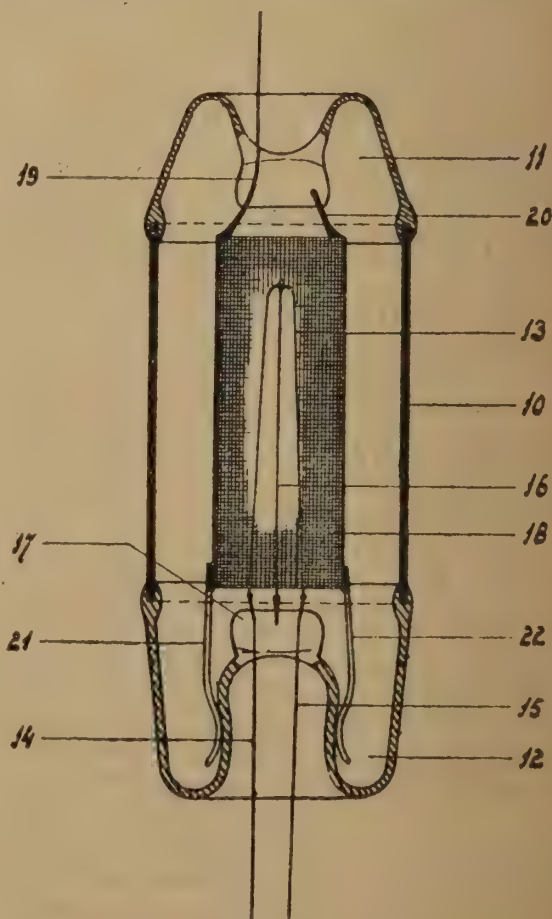


Fig. 31.

between the coefficients of expansion of the glass and the chrome-iron can be larger than is generally allowable with leading-in wires. With differences up to 20 per cent. good results can be obtained. We suppose that such differences are allowable owing to the property of chrome-iron that it very readily sticks to glass, or to use the technical expression, it "wets the glass." As an example it may be mentioned that excellent results have now been obtained when using chrome-iron, having a coefficient of expansion which differed by about 10 per cent. from that of the glass used."

"Nevertheless it is preferable to equalise as much as possible the coefficients of expansion of both materials. Considering the kind of glass used good results may be obtained with alloys containing 10-50 per cent. of chromium. In a special case (when fusing to so-called X-ray glass), an alloy containing about 17 to 20 per cent. of chromium gave highly satisfactory results."

British No. **193,633**. By B. T.-H. Co., Ltd. and G.E.C. of America.

The invention relates to the construction of the seals for the leading-in wires in a high-power valve, especially of the type in which the container consists partly of metal and partly of glass. The valve shown on Fig. 32 is described as follows:—

"The device shown in Fig. 32 comprises a glass container 1, sealed at one end to a cylindrical tube 2 of copper, or other suitable metal, which functions as anode, a suitable external connection being made when desired."

"Into the glass container 1 projects a re-entrant tube 4 consisting of lead glass and having branched ends 5, 6. Sealed to the ends of the branches 5, 6 are sockets 7, 8, consisting of copper-plated nickel-iron alloy. The tips of the tubes 5, 6, preferably are sealed over enlarged ends 7a, 8a formed on the sockets 7, 8, as indicated, the sealing operation being assisted by a coating of borax or other suitable flux. The sockets 7, 8, may consist of any other metal adapted to be sealed to glass by fusion, for example, platinum. We prefer to use an alloy of 36 parts nickel and 64 parts iron having a very thin coating of copper. Joined to the sockets 7, 8, and passing through the same are continuous lengths of conductors 9, 10 consisting of tungsten, nickel or other suitable metal. These conductors are preferably welded to the sockets 7, 8 and at the outer protruding ends 11, 12 thereof to seal the interior of the device from the atmosphere. The conductors or wires 9, 10 are connected to the terminals of a cathode 13 consisting for example, of tungsten, and adapted to be heated to incandescence by current supplied by the wires 9, 10. The wires 9, 10 may be connected by a screw-connected brace 14, suitable insulation being provided, such as mica, to prevent short-circuiting."

"In order to render the drawing complete, a third electrode 15 has been in part indicated by dotted lines, this electrode commonly assuming the form of a grid. It is supported by wires 16, 17 connected to a ring 18, encircling the tube 4. This electrode operates to control the current between the cathode 13 and the anode 2 but does not have any relation to our invention."

"Our improved seal for leading-in conductors renders practicable the conduction of greater currents into a sealed glass container than has hitherto been practicable and permits of the use of continuous lengths of standard conductors, which facilitates manufacture, and of variation in the cross-sectional area of the sockets, while the branches 5, 6 of the stem distribute the stresses and strains in the glass. The seal will remain intact even when

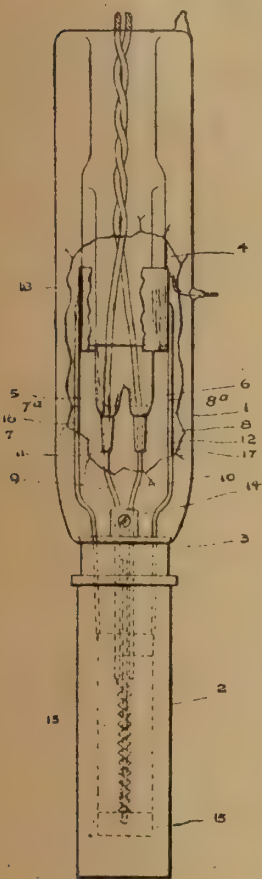


Fig. 32.

operated with currents high enough to heat the wires, 9 10 to a relatively high temperature."

British No. **197,853**. By W. R. BULLIMORE.

This specification describes the construction of the well-known "Cossor" valve as illustrated on Figs. 33, 34 and 35. The claims read as follows:—

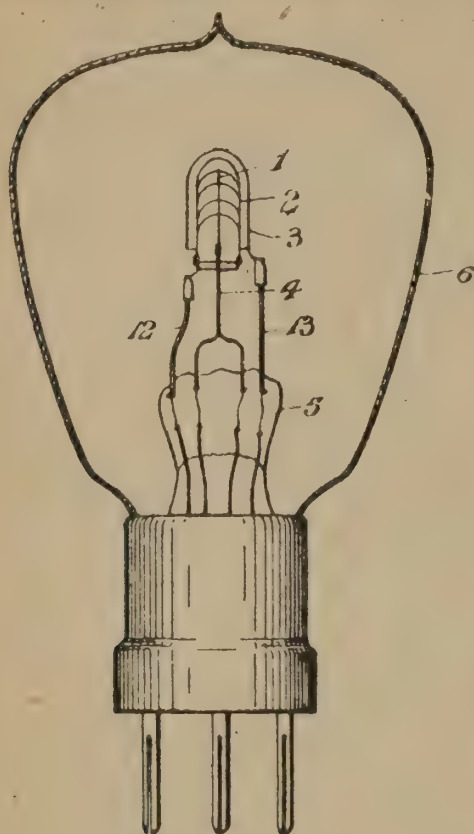


Fig. 33.

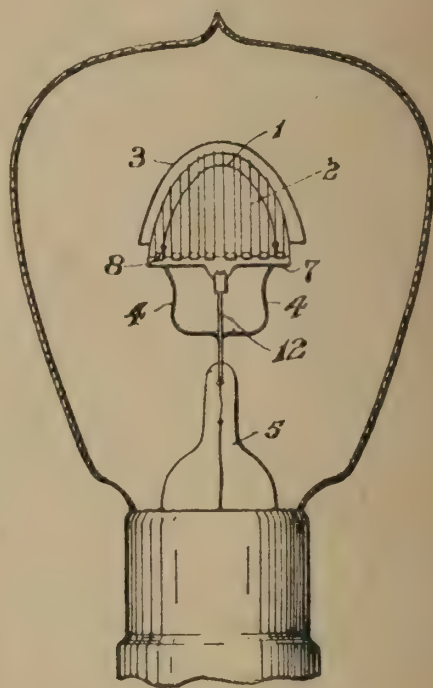


Fig. 34.

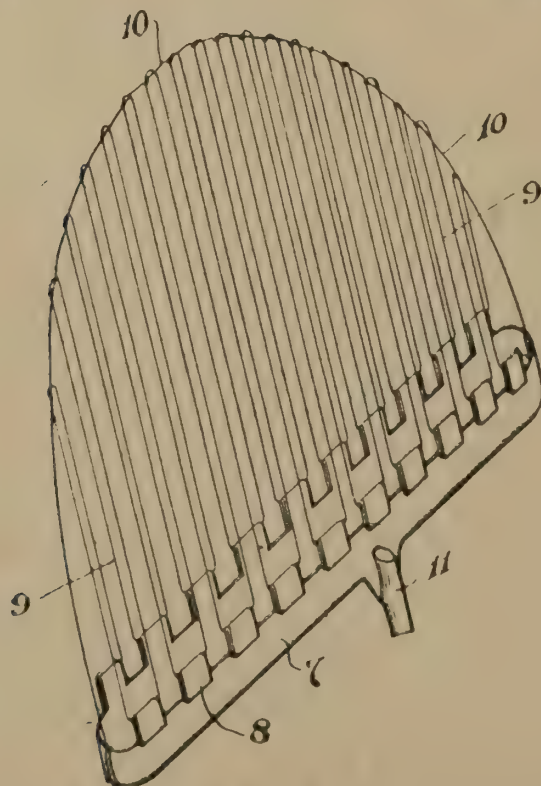


Fig. 35.

"(1) A thermionic valve of the three-electrode type, comprising an arched filament, an arched grid having flattened sides enclosing said filament and an arched anode having flattened sides enclosing the filament and grid, all of said electrodes being independently and rigidly supported from the re-entrant tube or tubes of a vitreous container."

"(2) In a thermionic valve, according to Claim 1, the method of constructing the grid electrode which consists in forming a collar having parallel sides and rounded ends with means for securing thereto a number of wire loops the tops of which form an arch concentric with the filament."

"(3) In a thermionic valve, according to Claim 2, the method of construction which consists in forming said collar with a castellated upper edge, in bending over the castellations to form hooks and in lacing a piece of wire around alternate hooks on opposite sides of the collar to form said loops."

British No. 198,757. By MARCONI'S W/T. CO., LTD., E. W. B. GILL and J. H. MORRELL.

The specification describes a method of employing a two or three-electrode valve for the purposes of generating oscillations of a very high frequency—about 300 millions per second. An example of an arrangement with a diode is shown on Fig. 36. To the plate and filament are attached telescoping

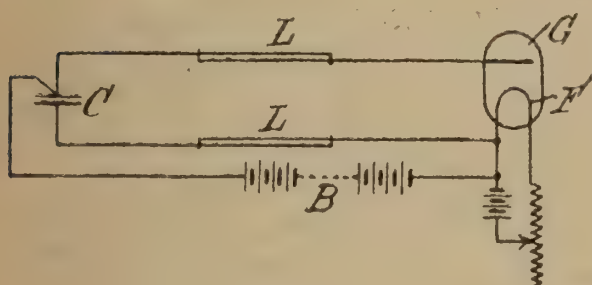


Fig 36.

wires L bridged over by condenser C. The plate is kept at a high positive potential by battery B. Fig. 37 illustrates the use for the same purpose of a triode. Here the grid is made highly positive both with regard to the filament and the plate. The latter is maintained either at the same or at a slightly more positive potential than the filament.

For a given length of the wires L, the amplitude of the oscillations is greatest at a certain potential of the grid. If the grid potential is further increased the amplitude at first decreases and then increases again and reaches a maximum, when it will be found that the frequency of the oscillations has increased to a value corresponding to that of the first harmonic of the fundamental. The battery leads should for best results at the new frequency be connected not to the terminals of the condenser but to points of the wires L where the potential nodes are located.

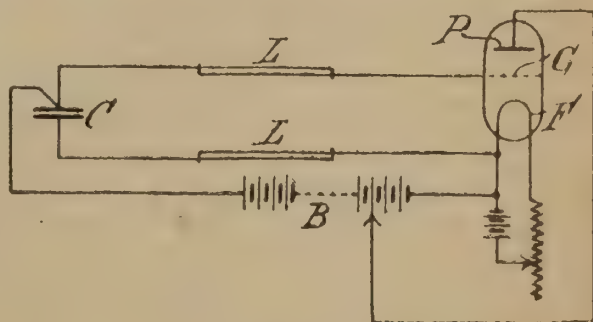


Fig. 37.

The frequency of the oscillations generated by the arrangement

can be calculated with a fair approximation by means of the formula

$$\lambda = 27 S v^{\frac{1}{2}}$$

where S is the distance in centimetres between plate and grid of the valve and v is the P.D. between grid and filament. It is stated in the specification that with ordinary valves and value of v between 100 and 200 volts, a wave-length of about 1 metre is obtained.

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923

Specifi- cation, No.	Date of Appli- cation,	No. of Appli- cation.	Name of Inventor.	Subject.
160,140	13/3/20	7,814/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Valves in parallel
160,819	31/3/20	9,470/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Production of tonic train
161,573	12/4/20	10,595/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless : calling devices
162,255	24/4/20	11,673/21	Société des Télégraphes Multiplex	Cascade arrangement of valves fo amplification
163,691	20/5/20	12,138/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless : calling devices
163,709	24/5/20	14,404/21	J. O. Maubaigne & G. Hill	Aerials in form of helices
164,721	10/6/20	12,515/21	R. Vallette	Rectification of A.C. by means of valves
165,096	18/6/20	16,875/21	Dr. E. F. Huth, G.m.b.H.	Valves as generators
165,413	23/6/20	17,258/21	Plauson's Forschungsin- stitut	Motors working from an H.F. supply
166,560	21/7/20	19,476/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Frequency changers
167,149	30/7/20	14,575/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Coupling of two circuits through two intermediate circuits
167,490	6/8/20	19,790/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Directional aerial combined with non-directional in order to obtain "sense" of direction
167,744	9/8/20	14,163/21	Ges. für Drahtlose Tele- graphie, m.b.H., and W. Schäffer	Controlling speed of H.F. alter- nators
168,882	30/8/20	22,897/21	C. G. Smith & American Radio & Research Corp.	Condensers
169,143	11/9/20	15,110/21	J. Bethenod	Multiplex transmitters
169,449	21/9/20	25,061/21	L. V. Lewitzki	Method of eliminating atmospheric
169,691	29/9/20	123,437/21	Ges. für Drahtlose Tele- graphie, m.b.H., and H. Gewecke	Wired wireless : line problems
169,724	2/10/20	26,127/21	Dr. E. F. Huth, G.m.b.H., & J. Oppenheimer	Wired wireless
170,015	8/10/20	26,807/21	C. G. Smith & American Radio & Research Corp.	Rectifiers
170,286	11/10/20	26,892/21	R. V. L. Hartley & West. Elec. Co., Ltd.	Wired wireless : calling devices
170,569	22/10/20	25,489/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Valves : gas-filled
170,584	21/10/20	27,868/21	B. P. Hamilton & Western Elec. Co., Ltd.	Wired wireless
170,834	28/10/20	26,673/21	W. C. White & British Thomson - Houston Co., Ltd.	Valves : gas-filled
171,097	2/11/20	29,167/21	K. Schwarz & Dr. E. F. Huth, G.m.b.H.	Wired wireless
171,378	10/11/20	29,321/21	Naamlooze Venn. Philips' Gloeilampenfabrieken	Valves : gas-filled
171,379	10/11/20	29,322/21	Naamlooze Venn. Philips' Gloeilampenfabrieken	Valves : gas-filled
171,683	18/11/20	29,428/21	P. O. Pedersen	Earth system
171,983	24/11/20	29,165/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Elimination of atmospheric
172,024	20/11/20	31,539/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Coupling of two circuits through two intermediate circuits
172,319	3/12/20	32,363/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Valves with five electrodes
172,320	4/12/20	32,364/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Valves with two grids
172,321	4/12/20	32,365/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless : calling devices
172,942	14/12/20	31,537/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Direction finding

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
173,220	22/12/20	32,976/21	H. J. Vennes & Western Electric Co., Ltd.	Valves as generators
173,510	23/12/20	34,657/21	A. Blondel	Direction finding
173,526	30/12/20	35,088/21	C. Schwarz & Dr. E. F. Huth, G.m.b.H.	Wired wireless: calling devices
174,043	11/1/21	31,538/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Valves in which the current in the plate circuit is of a square form
174,076	2/11/21	1,067/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Elimination of speech distortion in W/Telephony
174,636	31/1/21	2,536/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Means for reducing damping in rejector circuits
175,236	7 2 21	20,687/21	W. Dubilier	Condenser
175,245	5 2 21	31,536/21	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless
175,256	11 2 21	1,583/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Modulators with valves
175,258	9 2 21	1,988/22	N. V. Philip's Gloeilampen- fabrieken	Valves: gas-filled
175,291	11/2/21	4,157/22	F. H. L. Holweck	Seals for valves
175,595	18/2/21	20,688/21	W. Dubilier	Transmitting condensers
175,634	17/2/21	4,509/22	E. Mayer & Ges. für Drahtlose Telegraphie, m.b.H.	Wired wireless
175,635	16/2/21	4,510/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Valve with two grids
175,657	18 2/21	1,766/22	J. Massolle, J. Engl, & H. Vogt	Method of recording
176,381	5/3/21	6,465/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Earth systems
177,161	15/3/21	7,191/22	J. M. Miller	Cascade arrangement of valves for amplification
177,488	22/3/21	35,057/21	Société Française Radio- Electrique	Calling devices
177,763	30/3/21	35,058/21	Société Française Radio- Electrique	Method of eliminating atmospherics
177,769	29/3/21	4,982/22	Société Française Radio- Electrique	Receivers: automatic reception
177,776	30/3/21	8,078/22	Wireless Speciality Appa- ratus Co. & W. H. Priess	Condensers
177,785	2/4/21	8,953/22	L. J. Rich.	Valves as detectors
177,793	31/3/21	9,178/22	E. Peruzzi & S. Prete	Automatic reception
178,839	25/4/21	10,871/22	G. Passarge	Inductance coils
178,860	23/4/21	11,380/22	Ges. für Drahtlose Tele- graphy, m.b.H.	Wired wireless
179,509	2/5/21	35,056/21	E. Bellini	Direction finding
179,563	7/5/21	12,970/22	Felton & Guillaume Carls- werk, A.-G.	Wired wireless
179,960	14 5 21	13,552/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Wired wireless
180,295	18 5 21	1,790/22	A. W. Hull & B.T.H. Co., Ltd.	Dynatron
180,296	20 5 21	2,294/22	C. A. Hoxie & B.T.H. Co., Ltd.	Recording sound waves
180,332	18/5/21	14,030/22	C. W. Rice, E. W. Kellogg & B.T.H. Co., Ltd.	"Beverage" aerial
180,338	20/5/21	14,193/22	C. A. Hoxie & B.T.H. Co., Ltd.	Recording sound waves
180,655	24/5/21	12,364/22	A. W. Hull & B.T.H. Co., Ltd.	Dynatron magnetically controlled
180,672	30/5/21	14,224/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Frequency changers
180,673	27/5/21	14,225/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Aerials
180,683	25/5/21	14,773/22	H. H. Beverage & B.T.H. Co., Ltd.	"Beverage" aerial
180,991	1/6/21	12,653/22	F. H. L. Holweck	Pump for producing high vacua
182,105	24/6/21	16,061/22	E. Habar	Valves magnetically controlled
182,431	1/7/21	1,793/22	K. H. Kingdon & B.T.H. Co., Ltd.	Valves: gas-filled
182,762	2/7/21	397/22	R. Herzog & C. Lorenz, A.-G.	Method of producing short waves
182,780	5/7/21	17,428/22	E. Pfiffner	Condensers

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
182,817	11/7/21	18,917/22	Ges. für Drahtlose Tele- graphie, m.b.H.	Cathodes for valves
183,104	13/7/21	25,062/21	F. Schneider	Crystal detector
183,135	18/7/21	19,205/22	U. Ellero & P. Ellero ..	Photographic transmitters
183,389	29/7/21	27,512/22	N. V. Metaalraadlampen- fabriek, "Holland"	Means for keeping filament of valve taut
183,416	16/7/21	28,889/21	National Pneumatic Co. & H. Rowntree	Elimination of interference
184,195	5/8/21	21,378/22	Ges. für Drahtlose Tele- graphie, m.b.H.	A.C. supply for valves
184,475	9/8/21	21,691/22	H. Abraham	Multiplex reception
185,102	24/8/21	22,089/22	F. W. Young & Western Elec. Co., Ltd.	Conversion from crystal to valve detector and vice versa
185,384	29/8/21	1,792/22	E. F. Hennelly & B.T.H. Co., Ltd.	Means for supporting electrodes of valves which are magnetically controlled
185,396	30/8/21	17,592/22	A. Colleye	Flame recorder
185,463	4/5/21	12,746/21	E. W. Whiston	Transmission of photographs
185,475	23/5/21	14,340/21	P. N. Ware	Duplex: breaking-in circuits
185,496	2/6/21	15,316/21	L. G. Preston, H. Morris- Airey and G. Shearing	A.C. supply for valves
185,551	22/6/21	17,105/21	J. Hettinger & C. A. Vandervell & Co., Ltd.	Photographic recorder
185,753	8/9/21	24,276/22	H. J. Nolte & B.T.H. Co., Ltd.	Means for cooling the anode of a valve
185,775	12/3/21	7,887/21	G. A. Mathieu	Valve relay
185,795	10/5/21	13,266/21	Western Elec. Co., Ltd. ..	Multiplex signalling
185,848	13/6/21	16,283/21	A. W. Whistlecroft ..	Calling device
185,875	24/6/21	17,367/21	Société Française Radio- Electrique	Relay
185,923	29/7/21	20,406/21	A. E. Greenslade	H.F. intervalve transformer
185,967	29/9/21	25,822/21	H. P. P. Rees	Receiver design
186,094	22/4/21	11,700/21	N.V. Nederlandsche Radio Industrie	Microphone connections
186,117	15/6/21	16,425/21	S. G. Frost	Construction of grid leaks, etc.
186,129	16/6/21	16,639/21	H. J. Round	Generation of H.F. currents by a commutator
186,134	18/6/21	16,799/21	A. M. Young & N. W. Simpson	Wavemeters: direct reading
186,138	20/6/21	16,879/21	B.T.H. Co., Ltd.	Dynatron
186,198	14/7/21	19,070/21	Western Elec. Co., Ltd.	Filter circuits
186,305	23/9/21	7,893/22	J. C. N. Graafland ..	Relay
186,469	21/7/21	19,586/21	A. H. S. Colebrook and W. A. Williams	Renewal of filaments of valves
186,499	25/8/21	22,585/21	B.T.H. Co., Ltd.	Grids for valves
186,658	2/6/21	15,310/21	A. F. Sykes	Microphone
186,665	22/6/21	17,106/21	J. Hettinger and C. A. Vandervell & Co., Ltd.	Photographic recorder
186,771	11/8/21	21,333/21	W. R. H. Tingey	Inductance coils
186,946	5/4/21	10,038/21	Western Electric Co., Ltd.	Duplex
187,034	16/7/21	19,204/21	A. H. S. Colebrook and W. A. Williams	Means for supporting electrodes of valves
187,055	28/7/21	20,292/21	N. R. Campbell, G. E. Co., Ltd.	Production of high vacua
187,202	14/10/21	16,062/22	E. Habann	Valves magnetically controlled
187,206	11/10/21	21,377/22	Société Française Radio Electrique	Elimination of atmospherics by limiting devices
187,233	13/10/21	27,723/22	A. W. Hull and B. T. H. Co., Ltd.	Valves in cascade: resistance coupling
187,261	10/5/21	13,288/21	A. Meissner, W. Fitze and Ges. für Drahtlose Tele- graphie, m.b.H.	Cathodes for valves formed as a helix
187,363	9/8/21	21,105/21	N. F. S. Hecht	Direction finding
187,415	6/9/21	23,760/21	H. R. Rivers-Moore ..	Switch
187,457	28/10/21	28,659/21	B. H. N. H. Hamilton ..	Signalling with valve transmitters
187,646	18/5/21	13,977/21	H. J. Round	Valves in parallel
187,738	5/8/21	20,841/21	J. Robinson	Direction finding
187,907	20/7/21	5,096/22	J. H. Whittaker-Swinton ..	A.C. supply for valves
187,971	29/10/21	29,031/22	Nederlandsch-Indië and W. F. Einthoven	String galvanometers for reception
188,082	5/8/21	20,868/21	B.T.H. Co., Ltd.	Elimination of atmospherics by means of several aerials dis- tributed over a large area

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
188,108	23/8/21	22,380/21	B. S. Gossling and G. E. Co., Ltd.	Valves as rectifiers
188,391	8/8/21	21,026/21	B.T.H. Co, Ltd.	Photographic recorders
188,400	10/8/21	21,280/21	C. S. Agate and A. E. Hill	Means for keeping filament current constant
188,447	13/9/21	24,333/21	H. G. Cameron and Metro- politan Vickers Electri- cal Co., Ltd.	Seals for valves, lamps, etc.
188,483	4/10/21	26,220/21	H. S. Walker	Modulation with valves
188,505	20/10/21	27,883/21	B.T.H. Co., Ltd.	"Beverage" aerial: multiplex reception
188,551	30/11/21	32,067/21	W. Dorning	Frequency changing
188,670	12/11/21	30,904/22	R. H. Ranger and Mar- coni's W.T. Co., Ltd. . .	Elimination of atmospherics by means of several aerials, dis- tributed over a large area.
188,678	9/5/21	13,182/21	A. Blondel and M. Touly	Valves as generators
188,706	18/6/21	16,806/21	W. H. le Maréchal and Siemens Bros. & Co., Ltd.	Production of tungsten suitable for valves, lamps, etc.
188,707	18/6/21	16,809/21	B.T.H. Co., Ltd.	Dynatron provided with controlling grid
188,709	9/7/21	18,661/21	S. G. Brown	Microphones
188,763	16/8/21	21,705/21	L de Forest	Loud speaker
188,823	30/8/21	23,020/21	C. G. Eden and G.E. Co. Ltd.	Holders for valves
189,095	14/11/21	26,004/22	Ges. für Drahtlose Tele- graphie m.b.H.	Safety devices for valves
189,233	26/8/21	22,724/21	W. J. Davis	Calling device
189,266	7/9/21	23,790/21	G. P. Grenfell, H. L. Crow- ther, T. H. Gill and J. Erskine-Murray	Directional transmitting
189,270	9/9/21	24,045/21	A. C. Bartlett and G. E. Co., Ltd.	Cathodes for valves: maintenance of constant temperature
189,339	16/11/21	30,599/21	A. P. Welch	Holders for valves
189,349	30/11/21	32,066/21	W. Dornig	Frequency change s
189,350	30/11/21	32,068/21	W. Dornig	Transmitting condensers
189,516	29/8/21	22,861/21	L. G. Preston, B. Hodgson, C. E. Horton and G. W. Harris	Direction finding
189,645	1/12/21	32,160/21	L. B. Turner	Method of eliminating back- coupling in receivers
189,693	8/2/22	3,645/22	L. B. Turner	Multiplex reception
189,955	31/10/21	28,895/21	B.T.H. Co., Ltd.	Condensers
190,184	15/6/21	16,531/21	B.T.H. Co., Ltd.	High Power valves
190,218	12/9/21	24,207/21	B.T.H. Co., Ltd.	Photo-electric device
190,280	5/10/21	26,322/21	B.T.H. Co., Ltd.	"Beverage" aerial
190,505	24/6/21	17,366/21	Société Française Radio- Electrique	Elimination of atmospherics by current-limiting devices
190,532	21/9/21	25,077/21	J. P. Pra gnell	Inductances
190,759	29/8/21	22,860/21	A. F. Sykes	Microphone
190,777	21/9/21	25,076/21	J. P. Prangnell	Valve with five electrodes
190,790	26/9/21	25,479/21	F. Wilson and H. F. Robertson	High-speed reception
190,840	15/10/21	27,441/21	A. F. Sykes	Low frequency transformers
191,125	30/9/21	25,905/21	B.T.H. Co., Ltd.	"Beverage" aerial: multiplex reception
191,159	6/10/21	26,449/21	R. T. Smith	Frame aerial
191,485	14/10/21	27,310/21	B.T.H. Co., Ltd.	Elimination of interference
191,550	18/11/21	30,860/21	W. W. Burnham	Inductances
191,757	19/1/18	1,117/18	A. M. Low	Transmission of photographs
191,767	16/7/21	19,234/21	S. R. Mullard and Mullard Radio Valve Co., Ltd.	Grids and anodes for valves
191,777	12/9/21	24,180/21	J. Scott-Taggart and Radio Communication Co., Ltd	Valves as current-limiting devices
191,929	13/12/21	33,473/21	F. J. Chambers	Cascade arrangement of valve for amplification
191,973	14/2/22	4,282/22	B. H. N. H. Hamilton . .	Inductances
192,007	3/5/22	12,537/22	P. Brunet and G. Pelletier	Receiver designs
192,133	20/10/21	27,884/21	B.T.H. Co., Ltd.	Duplex
192,140	24/10/21	28,192/21	H. St. J. de A. Donisthorpe	Grids for valves
192,141	24/10/21	28,210/21	B.T.H. Co., Ltd.	Directive aerial system
192,171	28/10/21	28,696/21	H. M. Dowsett	Arc generators
192,272	21/1/22	1,838/22	J. F. Sutton	Inductances
192,346	30/9/21	34,655/22	B.T.H. Co., Ltd.	"Beverage" aerial

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cat on.	No. of Appli- cation.	Name of Inventor	Subject.
192,429	8/8/21	21,010/21	J. Scott-Taggart and Radio Communication Co., Ltd.	Reception of C.W.
192,460	29/10/21	28,790/21	C. Lorenz A.-G.	Frequency changing
192,461	29/10/21	28,791/21	C. Lorenz A.-G.	Frequency changing
192,464	31/10/21	28,871/21	W. R. Bullimore ..	Valves with spherical electrodes
192,476	1/11/21	29,022/21	W. R. Bullimore ..	Means for supporting the electrodes of valves
192,592	24/1/22	2,152/22	L. G. Preston, H. G. Hughes and B. Hodgson	Grids for valve
192,673	20/9/22	25,487/22	G. Holst and N. V. Philips' Gloeilampenfabriken	Construction of high power valves
192,744	13/10/21	27,197/21	G. S. Kemp	Condensers
192,785	9/11/21	29,918/21	L. G. Preston and G. Shearing	Valves in series for generating
192,795	11/11/21	30,189/21	L. G. Preston and N. Shuttleworth	Aerial coils
192,936	25/2/22	5,630/22	W. E. Barber and H. J. Warner	Frame aerials
193,072	16/8/21	21,707/21	L de Forest	Recording sound and light waves
193,092	14/10/21	27,309/21	B.T.H. Co., Ltd. ..	Dynatron
193,150	18/11/21	30,861/21	W. W. Burnham ..	Coil holders
193,203	19/12/21	34,139/21	Bing, A.-G.	Toy wireless transmitters
193,339	17/2/22	18,048/22	Soc. des Etablissements Gaumont	Loud speakers
193,438	29/8/21	22,894/21	W. H. Wilson	Secret transmission and reception
193,525	30/11/21	32,107/21	S. G. Frost	Means for supporting electrodes of valves
193,566	14/9/22	33,550/21	A. Onwood	Modulation with valves
193,628	24/1/22	2,150/22	L. G. Preston and B. Hodgson	Seals for valves
193,629	24/1/22	2,151/22	L. G. Preston and B. Hodgson	Means for supporting the electrodes of valves
193,633	27/1/22	2,516/22	B.T.H. Co., Ltd. ..	Seals for valves
193,690	7/3/22	6,740/22	H. P. P. Rees	Receiver design
193,882	30/8/21	23,013/21	J. Scott-Taggart and Radio Communication Co., Ltd.	Reception of C.W.
194,007	9/12/21	33,132/21	C. Lorenz, A.-G.	Frequency changers
194,070	14/1/22	1,235/22	E. Pollock	Duplex
194,798	9/5/22	13,085/22	N.V. Philips' Gloeilampen- fabriken	Seals for valves
194,328	5/9/21	23,579/21	J. Scott-Taggart and Radio Communication Co., Ltd.	Valves as generators
194,362	3/12/21	32,502/21	C. Lorenz, A.-G.	Modulation with magnetic ampli- fiers
194,365	5/12/21	32,580/21	W. Dornig	Aerials
194,378	7/12/21	32,872/21	R. W. Langridge and N. W. McLachlan	Recorders
194,424	16/12/21	33,907/21	A. F. Sykes	Microphone
194,459	10/1/22	750/22	P. G. A. H. Voigt ..	L.F. amplifier
194,510	10/2/22	3,971/22	S. G. Brown	Sound horns
194,595	19/5/22	14,182/22	S. G. Frost	Production of high vacua in valves
194,637	13/6/22	29,118/22	N.V. Philips' Gloeilampen- fabriken	Seals for valves
194,747	14/11/21	30,357/21	F. A. Johnsen & K. Rahbek	Recorders
194,765	13/12/21	33,549/21	E. Pollock	Valves as amplifiers
194,800	19/12/21	34,151/21	Bing, A.-G.	Toy wireless apparatus
194,836	3/1/22	202/22	E. Pollocik	Quiescent system for wireless telephony
194,864	24/1/22	2,153/22	L. G. Preston & G. Shearing	Signalling with C.W. transmitters
194,882	4/2/22	3,347/22	C. F. Trippe, O. Durdle & G. E. Co., Ltd.	Seals for valves
194,883	6/2/22	3,377/22	C. S. Goode	Magnetically controlled valves
194,899	15/2/22	4,468/22	L. G. Preston, H. G. Hughes and S. R. Mul- lard	Seals for valves
194,983	26/5/22	14,873/22	H. R. Rivers-Moore & R.M. Radio, Ltd.	Crystal detectors
195,051	14/3/22	5,361/23	L. L. Manley & Marconi's W. T. Co., Ltd.	Loop aerials

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
195,100	8/6/17	8,167/17	A. M. Low	Automatic transmitters
195,102	19/1/18	1,116/18	A. M. Low	H.F. transformer
195,134	17/12/21	34,041/21	G. H. Moody	Coil holders
195,266	22/3/22	8,381/22	W. H. Goodman & Dubi- lier Condenser Co., Ltd.	Condensers
195,310	21/3/22	17,171/22	P. Hemardinquer ..	Frame aerial
195,410	2/4/18	10,692/18	A. M. Low	Selective switches
195,440	23/12/21	34,672/21	B. S. Gossling & G. E. Co., Ltd.	Coated Cathodes
195,453	29/12/21	34,982/21	C. Lorenz, A.-G.	Arc generators
195,461	3/1/22	131/22	C. W. C. Beckman & P. Alexander	Coil-holders
195,546	9/5/22	13,048/22	N. F. S. Hecht	Safety devices for valves
195,656	27/9/21	25,591/22	C. C. Culver	Direction finding
195,657	10/4/22	26,089/21	C. P. Ryan	Relays
195,691	6/12/21	32,657/21	E. Y. Robinson	Valves completely surrounding the filament
195,698	7/12/21	32,892/21	E. B. Moullin	Voltmeter
195,718	30/12/21	35,084/21	C. Lorenz, A.-G.	Signalling with C.W. transmitters
195,782	12/1/22	1,020/22	Western Elec. Co., Ltd.	Wave filters
195,798	19/1/22	1,628/22	E. J. Quinn	Automatic signalling
195,814	3/2/22	3,221/22	G. Castagnoli	Variometers
195,838	27/2/22	5,800/22	Western Elec. Co., Ltd.	Controlling frequency of subsidiary stations by master stations
195,903	13/7/22	19,277/22	Igranic Elec. Co., Ltd. ..	Filament resistance
196,062	12/1/22	1,026/22	B.T.H. Co., Ltd.	Transmission of messages by dots only
196,085	16/1/22	1,326/22	J. Robinson & G. P. Grenfell	Direction signalling
196,188	3/5/22	12,404/22	A. W. Knight	Coil-holders
196,231	28/7/22	29,119/22	N.V. Philips' Gloeilampen- fabrieken	Seals for valves, etc.
196,233	12/12/22	33,926/22	A. L. A. Petty	Valves as amplifiers
196,308	18/10/21	27,599/21	S. R. Mullard & Mullard Radio Valve Co., Ltd.	Means for supporting filaments of valves
196,392	25/1/22	2,280/22	E. A. Graham	Diaphragms
196,453	16/3/22	7,753/22	A. P. Welch	L.F. transformers
196,497	16/5/22	13,811/22	N. V. Philips' Gloeilampen- fabrieken	Seals for valves, etc.
196,561	18/4/22	20,336/22	E. Austin & B.T.H. Co., Ltd.	Wired wireless
196,678	25/1/22	2,221/22	E. Y. Robinson,	Valves magnetically controlled
196,688	26/1/22	2,438/22	L. G. Preston, H. G. Hughes, & S. R. Mullard	Seals for valves; anodes for valves
196,986	30/1/22	2,676/22	C. B. Kerstin & U. Beaton	Inductances
197,077	20/2/22	4,923/22	J. B. Bolitho	Method of eliminating atmospheric
197,098	25/2/22	5,629/22	H. J. Warner & T. H. Kinman	Duplex
197,140	23/3/22	8,462/22	A. Onwood	Inductances
197,366	4/2/22	3,345/22	N. Lea & Radio Commu- nication Co., Ltd.	Alarm device
197,405	11/2/22	4,078/22	T. H. Kinman	Heterodyning: supersonic
197,435	20/2/22	4,938/22	G. R. Judge	Loud-speakers
197,437	21/2/22	5,065/22	A. Pedley	Sound horns
197,492	1/4/22	9,467/22	E. Y. Robinson	Insulation of aerials
197,556	1/6/22	15,460/22	W. H. Goodman & Dubilier Condenser Co., Ltd.	Condensers
197,572	22/6/22	17,241/22	E. Mallett & R. Marx ..	Inductances
197,758	27/2/22	5,801/22	Western Elec. Co., Ltd. ..	Wired wireless
197,782	8/3/22	6,862/22	P. d'Aigneaux	Conversion of D.C. into A.C.
197,853	22/6/22	17,232/22	W. R. Bullimore	Valves with hemi-spherical elec- trodes
197,854	24/6/22	17,481/22	B. E. G. Mittell & C. F. Elwell, Ltd.	L.F. transformers
198,052	23/2/22	5,378/22	W. Dubilier	Cascade arrangement of valves for amplification
198,062	24/2/22	5,553/22	H. T. Worrall	Ammeters and voltmeters
198,189	2/5/22	12,270/22	W. Ede, E. W. Scammell, S. H. van Abbott & Radio Mnfg. Co.	Grid leaks, etc.

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1923 (*continued*).

Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
198,247	8/7/22	18,748/22	A. H. S. Colebrook & W. A. Williams	Renewal of filaments in valves
198,322	27/5/22	29,117/22	N. V. Phillips' Gloeilampen-fabrieken	Seals for valves, etc.
198,425	1/3/22	6,092/22	L. G. Preston, C. E. Horton & G. W. Harris	Direction finding
198,428	1/3/22	6,112/22	H. J. Round	Method of eliminating atmospherics
198,522	24/4/22	11,436/22	J. Robinson, H. L. Crowther & W. H. Derriman	Directional transmitting
198,589	14/7/22	19,334/22	A. W. Knight	Coil-holders
198,757	6/3/22	6,574/22	E. W. B. Gill, J. H. Morrell & Marconi's W.T. Co., Ltd.	Short wave transmitters
198,799	13/3/22	7,364/22	W. H. Clifford	Loud speakers, gramophones, etc.
198,950	11/9/22	24,633/22	N. V. Philips' Gloeilampen-fabrieken	Valves as rectifiers
199,016	9/6/22	14,244/23	J. P. Maxfield & Western Elec. Co., Ltd.	Broadcasting station
199,038	9/6/22	15,050/23	W. R. G. Baker & B.T.H. Co., Ltd.	Magnetically-controlled valves
199,192	13/4/22	10,704/22	E. F. W. Alexanderson & B.T.H. Co., Ltd.	Multiplex transmission
199,233	23/5/22	14,494/22	H. P. Rees	Receiver designs
199,238	24/5/22	14,625/22	A. C. Huskinson	Variable condensers
199,258	22/6/22	17,195/22	J. H. L. Bridge	Inductances
199,279	31/7/22	20,870/22	J. Robinson	Tonic train transmitters for aircraft
199,412	22/12/21	34,559/21	C. Lorenz, A.-G.	Wired wireless
199,428	23/2/22	5,380/22	J. Scott-Taggart & Radio Communication Co., Ltd.	Reception of C.W.
199,434	13/3/22	7,336/22	N. Lea & Radio Communication Co., Ltd.	Direction finding
199,471	23/3/22	8,504/22	C. S. Franklin, B. J. Witt, G. M. Wright & S. B. Smith	Direction finding
199,483	25/3/22	8,718/22	E. B. Moullin	Voltmeters
199,651	26/9/22	26,015/22	E. Shipton	Loud speakers
199,678	20/5/22	2,652/22	A. P. Young & B.T.H. Co., Ltd.	Telephone receivers
199,964	17/7/22	19,560/22	L. G. Preston and W. Shuttleworth	Reception and transmission of C.W.
200,645	17/5/22	13,913/22	R. T. Smith and R. C. Bookless	Method of varying aerial and reactance coil with one operation
200,707	19/7/22	19,788/22	A. P. Welch	Valve holders
200,737	19/2/23	24,948/22	G. Schmidt and Siemens and Halske, A.-G.	Lightning arrester
200,774	22/1/23	1,955/23	Western Elec. Co., Ltd.	Grids for valves
200,854	20/1/22	1,791/22	B.T.H. Co., Ltd.	Seals for valves, etc.,
200,857	21/2/22	5,091/22	H. J. Round	Method of eliminating atmospherics
200,911	20/4/22	11,154/22	N. W. McLachlan	Relay
200,981	27/5/22	14,981/22	H. L. Thomas	Inductances
201,014	5/7/22	18,501/22	B. E. G. Mittell and C. F. Elwell, Ltd.	Switches
201,088	20/11/22	31,634/22	C. V. Morris	Combined filament resistance and valve holder
201,186	29/3/21	19,019/23	Société Française Radio Electrique	Reception: automatic
201,250	1/5/22	12,108/22	C. Holt	Valves with rectangularly shaped electrodes
201,264	5/5/22	12,662/22	E. Y. Robinson	Antenna insulation
201,276	9/5/22	13,047/22	N. F. S. Hecht	Valves in series for modulation
201,299	16/5/22	13,762/22	J. B. Bolitho	Relays
201,313	19/5/22	14,196/22	A. M. Keays and F. Paton-Moore	Loud speakers
201,585	2/3/22	6,239/22	E. Green	Valves as generators
201,591	26/3/22	8,825/22	E. Y. Robinson	Reception of modulated waves in which two amplifiers are used
201,720	27/6/22	17,703/22	A. E. Chapman	Variable Condensers
201,725	29/6/22	17,888/22	A. Barnett	Rectifiers
201,782	21/8/22	22,754/22	R. H. Marriott	Diaphragms for telephone receivers
201,816	14/10/22	27,867/22	C. H. Thornton and H. Saville	Variable condensers

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Specifi- cation. No.	Date of Appli- cation.	No. of Appli- cation.	Name of Inventor.	Subject.
201,845	27/12/22	35,182/22	W. Dornig	Condensers (transmitting)
201,859	7/2/23	3,699/23	A. C. Greene	Leading-in conductors for aeriels
202,047	12/5/22	13,454/22	Western Electric Co., Ltd.	High power valves
202,102	10/6/22	16,117/22	A. P. Welch	Filament resistances
202,105	14/6/22	16,477/22	Western Electric Co., Ltd.	Filters
202,111	17/6/22	16,827/22	L. G. Preston and J. C. W. Drabble	Rejector circuits
202,115	20/6/22	17,009/22	A. H. S. McCallum ..	Inductances
202,228	29/1/23	2,592/23	H. J. Osborn	Production of high vacuum in valves, etc.
202,418	20/5/22	14,300/22	A. P. Young and B.T.H. Co., Ltd.	Loud speakers
202,438	27/5/22	14,980/22	H. L. Thomas	Inductances
202,513	17/8/22	22,419/22	B.T.H. Co., Ltd. ..	Insulators
202,520	28/8/22	23,284/22	H. R. Rivers-Moore and R. M. Radio, Ltd.	Crystal detectors
202,700	16/5/22	13,763/22	J. B. Bolitho	Method of eliminating atmospherics
202,733	25/5/22	14,678/22	J. Robinson, H. L. Crowther and W. H. Derri-man	Direction finding
203,052	31/5/22	15,365/22	W. T. Ditcham	Transmitting condensers
203,053	31/5/22	15,367/22	H. J. Round	Method of applying auxiliary potential to crystal receivers
203,097	22/6/22	17,233/22	W. R. Bullimore ..	Grids for valves
203,446	28/6/22	17,842/22	B.T.H. Co. Ltd.	"Beverage" aerial
203,451	1/7/22	18,134/22	C. K. Chandler	Method of eliminating magneto noises on aircraft receivers
203,517	1/6/23	24,122/22	H. P. P. Rees	Crystal detectors
203,799	16/6/22	16,718/22	C. Davis	Direction finding
203,885	31/8/22	23,683/22	F. J. Kaehel and W. L. Kaehni	Loud speakers
204,119	21/6/22	17,095/22	A. Onwood and Gambrell Bros., Ltd.	Mountings for coils and coil holders
204,130	23/6/22	17,359/22	B.T.H. Co., Ltd. ..	Seals for valves, etc.
204,185	12/8/22	22,000/22	Western Electric Co., Ltd.	Wired wireless
204,237	10/11/22	30,759/22	L.G. Preston, H.G. Hughes and A. C. Kirkham ..	Method of supporting filament of valves
204,376	24/6/22	17,438/22	Igranic Electric Co., Ltd. A. H. Curtis, A. H. Mackley and W. S. Pyrah	Coil-holders
204,389	27/6/22	17,693/22	J. A. Slee	Direction finding
204,482	22/8/22	22,773/22	E. Y. Robinson	Reception of C.W., etc
204,546	16/10/22	28,014/22	C. Cory & Son, Inc. ..	Telephone receivers
204,663	26/6/23	16,575/23	L. L. Ravenscroft ..	Crystal receiver

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1,429,240	24/2/20	E. C. Hanson and E. T. Jones	—	Underground antenna system
1,429,572	14/8/18	H. J. J. M. de R. de Bellescize	—	Receiving system
1,430,607	31/10/17	W. C. White ..	G. E. Co. of America	Valve with a rectilinear characteristic
1,430,883	23/3/21	B. Bradbury ..	G. E. Co. of America	Dynatron
1,431,393	16/5/17	A. L. Golden ..	National Radio Co.	Spark transmitters
1,432,022	11/10/18	R. A. Heising ..	Western Elec. Co. ..	Valves in which filament is heated by A.C.
1,432,354	30/3/21	W. H. Nottage ..	Radio Corporation of America	Method of connecting wireless station to land lines
1,432,384	12/6/19	W. W. Connors ..	—	Control of moving bodies by wireless
1,432,411	21/4/21	J. H. Payne, Jr.	G. E. Co. of America	Construction of grid electrodes of valves
1,432,438	2/9/19	J. Bethenod ..	—	Method of coupling antenna to H.F. alternator
1,432,455	28/7/19	A. N. Goldsmith	Radio Corporation of America	Reception of C.W.
1,432,456	29/7/19	A. N. Goldsmith	Radio Corporation of America	Reception of C.W.
1,432,867	15/11/19	M. J. Kelly ..	Western Elec. Co. ..	Method of manufacture of valves
1,432,931	1/11/16	H. W. Weinhart	Western Elec. Co. ..	Means for cooling anode of valves
1,432,992	5/9/18	J. O. Gargan ..	Western Elec. Co. ..	Mountings for valves
1,433,070	6/6/19	W. W. Connors ..	—	Control of moving bodies by wireless
1,433,224	29/3/20	J. Parkin, Jr.	—	Variable condenser
1,433,599	2/7/21	R. Bown ..	American Telephone and Telegraph Co.	Method of simultaneously transmitting and receiving wireless telephony
1,434,064	15/9/13	A. Monteilhet ..	E. Belin ..	Transmission reception of photographs, etc.
1,434,707	21/4/21	E. W. Kellogg ..	G. E. Co. of America	Multiplex reception: antenna systems
1,434,984	3/5/21	H. H. Beverage	G. E. Co. of America	Antenna system
1,434,985	3/5/21	H. H. Beverage	G. E. Co. of America	Antenna system
1,434,986	25/5/21	H. H. Beverage	G. E. Co. of America	Antenna system
1,435,009	27/4/21	E. W. Kellogg and C. W. Rice	G. E. Co. of America	Multiplex reception
1,435,455	2/2/20	H. P. Donle ..	Connecticut Telephone & Elec. Co.	Construction of a valve
1,435,941	12/11/18	J. Robinson ..	—	Direction finding
1,436,252	27/12/18	R. A. Heising ..	Western Elec. Co. ..	Are-generating systems
1,436,676	21/10/21	M. H. Petersen ..	—	Transmission of writing, pic- tures, etc.
1,437,021	11/5/21	J. C. Schelleng ..	Western Elec. Co. ..	Valves in cascade
1,437,240	28/5/20	E. C. Hanson and W. L. Carlson	—	Valve detectors
1,437,400	12/6/19	W. W. Connors ..	—	Control of moving bodies by wireless
1,437,498	16/6/16	L. de Forest ..	De Forest Radio Tele- phone & Telegraph Co.	Oscillon
1,437,607	18/11/20	E. L. Mueller ..	—	Valve in which an arc discharge is used in place of a filament
1,437,772	13/6/22	J. B. Nowlan ..	S. Bitterman ..	Receiver design
1,438,290	1/7/18	W. E. Beakes ..	United Fruit Co. ..	Aerials
1,438,347	6/3/20	R. A. Weagant ..	Radio Corporation of America	Method of eliminating inter- ference
1,438,567	1/2/19	R. E. Winstanley	—	Automatic transmitter

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1,438,969	17/9/18	L. R. Spengeman	Western Elec. Co. ..	Manufacture of valves
1,438,987	30/9/19	H. A. Affel and L. Espenschied	Amer. Telephone and Telegraph Co.	Modulating systems
1,438,988	30/9/19	H. A. Affel and L. Espenschied	Amer. Telephone and Telegraph Co.	Modulating systems
1,438,989	30/9/19	H. A. Affel and L. Espenschied	Amer. Telephone and Telegraph Co.	Modulating systems
1,439,134	7/4/19	L. J. Sivian ..	Western Elec. Co. ..	Modulating systems
1,439,363	13/12/19	J. H. Hammond, Jnr.	—	Control of moving bodies by wireless
1,439,495	25/9/22	H. M. Williamson	—	Means for reducing inter- ference
1,439,562	9/9/21	P. D. Lowell ..	Radio Instrument Co.	H.F. amplifiers
1,439,947	29/6/21	L. Cohen ..	—	Method of eliminating inter- ference
1,440,432	25/6/21	C. T. Allcutt ..	Westinghouse Elec. and Manufg. Co.	Magnetically-controlled valve
1,440,834	2/7/21	C. V. Logwood ..	De Forest Radio Tele- phone & Telegraph Co.	Wireless telephone transmission system
1,441,029	31/3/20	H. J. Round ..	Radio Corporation of America	Quiescent system for wireless telephony
1,441,087	6/4/21	J. W. Hill ..	—	Method of wiring valve trans- mitters
1,441,988	18/12/20	E. P. Lindner ..	—	Crystal detector
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1,442,147	17/11/16	R. A. Heising ..	Western Elec. Co. ..	Modulation with valves
1,442,430	31/12/19	R. V. L. Hartley	Western Elec. Co. ..	Method of supplying current to valves
1,442,439	4/11/16	R. C. Mathes ..	Western Elec. Co. ..	Method of supplying current to valves
1,442,781	7/7/21	H. W. Nichols ..	Western Elec. Co. ..	Filter circuits
1,443,011	3/11/22	H. J. J. M. de R. de Bellescize	—	Method of eliminating inter- ference
1,443,209	15/9/20	B. Bradbury ..	G. E. Co. of America	Method of receiving C.W.
1,443,361	27/7/17	J. H. Hammond	—	System of secret wireless tele- graphy
1,443,984	19/6/19	L. Espenschied ..	Amer. Telephone and Telegraph Co. ..	Wired wireless
1,443,985	21/6/19	L. Espenschied ..	Amer. Telephone and Telegraph Co.	Duplex
1,444,417	17/10/17	J. H. Hammond, Jnr.	—	Control of moving bodies by wireless
1,444,438	7/8/18	W. C. White ..	G. E. Co. of America	Construction of grids for valves
1,444,534	15/2/18	B. Ames and P. J. Gillonson	—	Condenser
1,444,605	21/1/19	R. A. Heising ..	Western Elec. Co. ..	Modulation with valves
1,445,278	1/11/17	R. A. Heising ..	Western Elec. Co. ..	Means for heating the filament of a valve
1,445,613	6/4/22	H. P. Donle ..	Connecticut Telephone and Electric Co.	Crystal detector
1,445,636	3/5/22	A. Meissner ..	—	Indicator for H.F. currents
1,445,731	30/9/18	H. J. Van der Bijl	Western Elec. Co. ..	Transmission system
1,445,929	7/10/20	W. R. G. Baker ..	G. E. Co. of America	Modulation with valves
1,446,246	18/9/19	Lee de Forest ..	—	Simultaneously recording and reproducing sound and light waves
1,446,247	16/3/21	Lee de Forest ..	—	Simultaneously recording and reproducing sound and light waves
1,446,425	3/8/22	A. Leib ..	—	Wave-meter
1,446,433	3/8/22	W. Schaffer ..	—	Wave-meter
1,446,434	18/8/22	W. Schaffer and F. Kruschinsky	—	Method of supplying A.C. to valves
1,446,650	22/10/19	B. Macpherson ..	Wireless Speciality Apparatus Co.	Condenser
1,446,752	29/12/16	B. W. Kendall ..	Western Elec. Co. ..	Frequency changing
1,446,890	7/6/18	L. Espenschied ..	Amer. Telephone and Telegraph Co. ..	Method of eliminating inter- ference
1,447,165	30/1/19	F. A. Kolster ..	—	Direction finding
1,447,204	30/9/19	L. Espenschied ..	Amer. Telephone and Telegraph Co.	Multiplex transmitters

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1,447,481	22/8/21	H. Morris-Airey, G. Shearing and S. R. Mullard	—	Valves with silica envelope
1,447,773	15/9/21	L. Espenschied & R. Bown	Amer. Telephone and Telegraph Co.	Transmission system
1,447,779	27/12/10	J. H. Hammond, Jnr.	—	Transmission system
1,447,793	19/8/21	M. Latour ..	—	Crystal receivers
1,448,207	11/5/22	W. F. Gehrig ..	Essex Speciality Co.	Receiver design
1,448,216	6/7/18	R. A. Heising ..	Western Elec. Co. ..	Modulation with valves
1,448,408	21/1/20	J. S. Jammer ..	Western Elec. Co. ..	Duplex system
1,448,550	3/2/19	H. D. Arnold ..	Western Elec. Co. ..	Amplifier circuits
1,448,575	21/12/20	G. H. Stevenson	Western Elec. Co. ..	Wave-meter
1,448,702	10/7/20	J. R. Carson ..	Amer. Telephone and Telegraph Co.	Modulation with valves
1,449,148	9/3/22	W. F. Gehrig ..	Essex Speciality Co.	Crystal detector
1,449,253	23/9/21	M. S. Strock ..	—	Directional receiving system
1,449,372	1/12/15	H. D. Arnold ..	Essex Speciality Co.	Modulation with valves
1,449,382	1/12/15	J. R. Carson ..	Amer. Telephone and Telegraph Co.	Modulation with valves
1,449,722	17/9/21	W. R. G. Baker ..	G. E. Co. of America	Modulation with valves
1,449,871	12/1/22	J. B. Pratt ..	G. E. Co. of America	Modulation with magnetic amplifiers
1,449,878	12/1/22	E. Austin ..	G. E. Co. of America	Modulation with magnetic amplifiers
1,449,911	12/11/21	R. H. Ranger ..	Radio Corporation of America	Method of recording signals
1,450,038	28/4/20	G. Hill ..	—	Wave-meter
1,450,246	28/1/20	W. G. Cady ..	—	Piezo-electric resonator
1,450,265	18/4/19	J. Slepian ..	Westinghouse Elec. and Manufg. Co.	Rectifiers
1,450,413	10/3/19	H. W. Edmundson & W. T. Munro	G. E. Co. of America	Construction of electrodes of valves
1,450,749	11/3/14	G. W. Pierce ..	P. C. Hewitt ..	Method of controlling electric currents
1,451,426	9/4/18	L. J. Lesh ..	E. J. Simon ..	Spark-gaps
1,451,427	5/6/18	L. J. Lesh ..	E. J. Simon ..	Spark-gaps
1,452,032	30/4/18	J. F. Farrington	Western Elec. Co. ..	C.W. transmitters
1,452,064	22/11/18	V. Bush ..	American Radio and Research Corpn.	Quenched spark-gaps
1,452,339	28/5/18	R. A. Heising ..	Western Elec. Co. ..	Receiving and amplifying system with valves
1,452,399	2/8/22	H. W. Tompkins	—	Variable resistance
1,452,610	2/9/20	M. Klosner ..	—	Variable condenser
1,452,859	13/12/21	H. J. Round ..	Radio Corporation of America	Multiplex transmission: aerial systems
1,452,925	18/12/20	W. H. Nottage & T. D. Parkin	Radio Corporation of America	Calling devices
1,452,933	10/10/18	M. I. Pupin ..	Westinghouse Elec. and Manufg. Co.	Selective multi-stage valve amplifier
1,452,957	23/8/16	E. H. Colpitts ..	Western Elec. Co. ..	Carrier wave signalling
1,452,960	18/12/20	W. T. Ditcham ..	Radio Corporation of America	Signalling with C.W. trans- mitters
1,453,267	29/11/18	J. L. Bradford ..	De Forest Radio Tele- phone & Telegraph Co.	Manufacture of filaments for valves
1,454,307	12/12/19	A. L. Anderson ..	A. Taylor ..	Signalling with arc generators
1,454,328	3/9/21	A. Meissner ..	—	Valve with two grids and two anodes
1,454,532	1/8/17	W. E. Beatty ..	Western Elec. Co. ..	Secret signalling
1,454,592	7/1/21	H. R. C. Van de Velde and J. M. Furnival	Radio Corporation of America	Direction finding
1,454,598	18/12/20	W. T. Ditcham ..	Radio Corporation of America	Signalling with valve trans- mitters
1,454,624	27/4/20	C. C. Chapman ..	A. Taylor ..	Signalling with arc generators
1,454,629	6/6/21	H. F. Elliott ..	A. Taylor ..	Signalling with C.W. trans- mitters
1,454,630	6/6/21	H. F. Elliott ..	A. Taylor ..	Signalling with C.W. trans- mitters
1,454,652	22/11/21	H. Pratt ..	A. Taylor ..	Signalling with C.W. trans- mitters

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1,454,997	18/4/22	K. G. Wolff and, G. Greco	—	Crystal detector
1,455,099	5/1/22	W.R.G.Baker ..	G. E. Co. of America	Signalling with valve trans- mitters
1,455,141	27/3/22	P. D. Lowell ..	—	Method of using A.C. for valves
1,455,458	15/10/18	J. S. E. Townsend	—	Wavemeter
1,455,767	31/12/21	J. Slepian ..	Westinghouse Elec. and Manufg. Co.	H.F. amplifier
1,455,768	20/1/22	J. Slepian ..	Westinghouse Elec. and Manufg. Co.	H.F. amplifier
1,455,781	7/12/21	W. Dubilier ..	Dubilier Condenser and Radio Corpn.	Condenser
1,455,845	2/5/21	N. Lea ..	—	Modulation with valves
1,455,896	9/2/21	L. B. Turner ..	—	High-speed signalling
1,456,504	13/4/20	W. G. Houskeeper	Western Elec. Co. ..	Method of supporting elec- trodes of valves
1,456,505	12/5/19	W. A. Knoop and P. P. Cioffi	Western Elec. Co. ..	Method of supporting elec- trodes of valves
1,456,528	10/5/15	H. D. Arnold ..	Western Elec. Co. ..	Construction of power valves
1,456,595	13/4/18	C. A. Hoxie ..	G. E. Co. of America	Photographic recorder
1,456,867	15/5/19	F. Conrad ..	Westinghouse Elec. and Manufg. Co.	Control of moving bodies by Wireless
1,457,069	27/9/19	L. Levy ..	—	Method of eliminating atmos- pherics
1,457,447	22/12/21	J. Mills ..	Western Elec. Co.	Radio receiving circuits
1,457,814	14/12/21	H. L. Becker ..	G. E. Co. of America	Amplification with magneti- cally controlled valves
1,458,153	20/8/19	F. H. Shaw ..	—	Valve-holder
1,458,466	7/7/19	A. Crossley ..	—	Antenna selector switch
1,458,949	7/1/22	H. W. Nichols ..	Western Elec. Co. ..	Modulation with valves
1,459,308	6/4/20	D. G. McCaa ..	Federal Telegraph Co.	Method of eliminating atmos- pherics
1,459,400	17/11/16	C. D. Hocker ..	Western Elec. Co. ..	Manufacture of electron-emit- ting cathodes
1,459,412	16/4/15	A. McL. Nicholson	Western Elec. Co. ..	Manufacture of electron-emit- ting cathodes
1,459,417	1/11/16	P. Schwerin ..	Western Elec. Co. ..	Means for cooling anode of valves
1,459,786	19/1/20	D. G. McCaa ..	Federal Telegraph Co.	Method of eliminating inter- ference
1,460,439	22/4/22	G. W. Pickard ..	Wireless Speciality Apparatus Co.	Method of eliminating inter- ference
1,460,636	9/8/20	P. J. Armagnat ..	—	Wavemeter
1,460,734	27/4/22	H. H. Ruf ..	—	Detector
1,460,801	20/6/21	R. H. Marriott ..	—	Directional receiving system
1,461,064	10/2/21	L. K. Martin ..	Amer. Telephone and Telegraph Co.	Multiplex transmission
1,461,232	3/9/18	S. Thronsen ..	Western Elec. Co. ..	Supports for filament of valves
1,461,287	10/1/22	E. Pfiffner ..	—	High tension condenser
1,461,754	3/3/21	G. H. Clark ..	Radio Corporation of America	High-speed signalling
1,462,038	30/12/16	R. V. L. Hartley	Western Elec. Co. ..	Modulating system
1,462,057	27/9/20	P. I. Wold ..	Western Elec. Co. ..	Switching arrangements for valves
1,462,882	24/3/22	H. Chireix ..	—	Calling device
1,463,386	22/4/20	W. L. Carlson and E. C. Hanson	—	Recorders
1,463,391	11/2/20	W. L. Carlson and E. C. Hanson	—	Recorders
1,463,432	2/8/17	H. W. Nichols ..	Western Elec. Co. ..	Supplying A.C. to electrodes of valves
1,463,433	4/12/18	H. W. Nichols ..	Western Elec. Co. ..	Supplying A.C. to electrodes of valves
1,463,475	19/3/21	S. Löwe ..	Western Elec. Co. ..	Modulation with valves
1,463,554	4/2/22	A. N. Pierman ..	—	Crystal detectors
1,463,795	10/10/18	J. R. Carson ..	Amer. Telephone and Telegraph Co.	Modulation with valves : wired wireless
1,463,796	10/10/18	J. R. Carson ..	Amer. Telephone and Telegraph Co.	Modulation with valves : wired wireless
1,463,818	29/12/16	J. W. Harris ..	Western Elec. Co. ..	Manufacture of electron-emit- ting cathodes

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1,463,860	22/7/20	W. Wilson ..	Western Elec. Co. ..	Seals for valves
1,463,994	15/2/18	J. H. Hammond	—	Secret wireless transmission and reception
1,464,083	19/3/21	S. Loewe ..	Western Elec. Co. ..	Reception of C.W.
1,464,086	27/12/18	W. E. Beatty ..	Western Elec. Co. ..	Secret transmission and reception
1,464,096	28/8/20	R. V. L. Hartley	Western Elec. Co. ..	Secret transmission and reception
1,464,097	7/8/20	R. A. Heising ..	Western Elec. Co. ..	Duplex
1,464,111	23/12/19	H. S. Read ..	Western Elec. Co. ..	Low frequency amplifier
1,464,104	26/7/17	A. McL. Nicolson	Western Elec. Co. ..	Recorder
1,464,124	26/7/17	W. Wilson ..	Western Elec. Co. ..	Methods of coating filaments of valves
1,464,168	9/7/17	W. A. Boyd and W. T. Booth ..	Western Elec. Co. ..	Aerials for aeroplanes
1,464,274	15/5/22	S. Storch ..	S. E. Tepper and D. Berwick	Coil-holder
1,464,322	26/11/20	F. A. Kolster ..	C. D. Ehret ..	Reception of C.W.
1,464,533	26/8/21	S. Loewe ..	—	Methods of suppressing tendency of valve amplifiers to oscillate
1,464,565	13/4/21	L. Espenschied ..	Amer. Telephone and Telegraph Co.	Calling device for radio-telephony
1,465,108	16/9/18	E. F. W. Alexanderson	G. E. Co. of America	Directional reception
1,465,250	25/4/18	L. N. Brillouin ..	—	Resistance coupled amplifier
1,465,264	14/9/20	F. G. Goldstone ..	J. F. Bernard and J. B. Bolitho	Variable condenser
1,465,332	3/9/15	H. D. Arnold ..	Western Elec. Co. ..	L.F. amplifiers
1,465,357	27/9/19	R. A. Heising ..	Western Elec. Co. ..	Multiplex transmission and reception
1,465,358	29/9/19	R. A. Heising ..	Western Elec. Co. ..	Multiplex transmission and reception
1,465,381	4/11/18	R. F. Trimble ..	Western Elec. Co. ..	Construction of the electrodes of valves
1,465,394	6/11/20	W. G. Houskeeper	Western Elec. Co. ..	Regulation of vacuum in thermionic tubes.
1,465,732	23/9/19	R. A. Heising ..	Western Elec. Co. ..	High-speed signalling
1,465,932	11/9/15	E. H. Colpitts ..	Western Elec. Co. ..	Multiplex transmission and reception
1,465,961	19/4/16	E. F. W. Alexanderson	G. E. Co. of America	Method of eliminating atmospherics
1,465,962	19/4/16	E. F. W. Alexanderson	G. E. Co. of America	Method of eliminating atmospherics
1,465,997	27/2/19	H. C. Rentschler	Westinghouse Lamp Co.	Vacuum tubes
1,465,998	27/2/19	H. C. Rentschler	Westinghouse Lamp Co.	Vacuum tube
1,466,263	10/4/22	E. F. W. Alexanderson	G. E. Co. of America	Production of interrupted C.W.
1,466,707	16/3/16	L. Espenschied ..	Amer. Telephone and Telegraph Co.	Limiting device with valves
1,466,841	7/8/20	L. Levy ..	—	Method of eliminating atmospherics
1,467,154	7/6/12	J. H. Hammond, Jr.	—	Control of moving bodies by wireless
1,467,318	17/8/20	W. J. Herdman ..	—	Valves in which the plate filament distance can be varied
1,467,398	19/3/20	E. E. Schumacher	Western Elec. Co. ..	Coating cathodes of valves
1,467,596	28/5/18	P. I. Wold ..	Western Elec. Co. ..	Modulation with valves
1,467,776	16/1/19	P. E. Demmler ..	Westinghouse Elec. and Manufg. Co.	Manufacture of condensers
1,467,777	15/2/19	P. E. Demmler ..	Westinghouse Elec. and Manufg. Co.	Manufacture of condensers
1,467,988	16/3/22	C. A. Hoxie ..	G. E. Co. of America	Method of receiving C.W.
1,468,049	9/10/18	A. H. Taylor ..	Radio Corporation of America	Method of eliminating atmospherics
1,468,059	7/2/19	R. A. Weagant ..	Radio Corporation of America ..	Method of eliminating atmospherics
1,468,060	19/7/17	R. A. Weagant ..	Radio Corporation of America	Method of eliminating atmospherics

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1,468,061	7/2/19	R. A. Weagant ..	Radio Corporation of America	Method of eliminating atmos- pherics
1,468,062	12/7/18	R. A. Weagant ..	Radio Corporation of America	Method of eliminating atmos- pherics
1,468,116	10/12/14	I. Langmuir ..	G. E. Co. of America	Valves as limiting devices
1,468,250	21/6/21	S. O. E. T. Trost ..	Radio Corporation of America	Production of C.W. by spark transmitters
1,468,653	30/7/23	C. D. Tuska ..	—	Variable condenser
1,469,075	23/3/21	H. E. Dunham ..	G. E. Co. of America	Dynatron with independent grid
1,469,328	3/8/22	A. Leib and E. Mayer	Ges. für Drahtlose Telegraphie	Method of tuning receivers
1,469,349	1/4/21	A. L. Wilson	Westinghouse Elec. and Manufg. Co.	System of remote control
1,469,561	21/1/20	M. R. Hutchison	—	Recorders
1,469,889	25/4/18	M. L. Chaffee ..	J. H. Hammond, Jr.	Multiplex reception
1,469,905	13/8/19	R. E. Hall ..	Hall Research Corp.	Automatic transmitters: methods of keying
1,470,088	29/11/18	F. Lowenstein ..	W. Dubilier ..	Low-frequency signalling
1,470,628	17/7/20	M. Latour ..	—	Signalling with H.F. alterna- tors
1,470,781	3/10/17	P. Thomas ..	Westinghouse Elec. and Manufg. Co.	Condensers
1,470,955	22/11/19	W. E. Booth ..	Western Elec. Co. ..	Duplex system for telephony
1,471,013	19/11/19	J. B. Speed ..	Western Elec. Co. ..	Microphone
1,471,165	19/7/20	L. L. Jones ..	—	Method of eliminating inter- ference
1,471,319	3/1/21	H. F. Elliott, H. Pratt and E. B. Murphy	A. Taylor ..	Signalling with arc generators
1,471,406	25/7/19	F. S. McCullough	G. L. Martin ..	Direction finding means
1,471,756	17/10/19	W. B. Schulte ..	Burgess Battery Co.	Dry batteries for use with valves
1,472,092	9/7/21	H. J. Round ..	Radio Corporation of America	Method of eliminating atmos- pherics
1,472,218	5/8/19	J. H. Hammond, Jr.	—	Selective transmission and reception
1,472,470	30/3/18	R. V. L. Hartley	Western Elec. Co. ..	Valves as amplifiers
1,472,477	14/8/19	R. W. King ..	Western Elec. Co. ..	Construction of power valves
1,472,822	24/9/19	H. A. Affel ..	Amer. Telephone and Telegraph Co.	Calling device for wireless receivers
1,473,070	15/9/19	S. T. Woodhull ..	American Radio and Research Corp.	Quenched spark gaps
1,473,179	10/11/20	R. A. Fessenden ..	Submarine Signal Co.	Method of eliminating inter- ference
1,473,220	23/8/21	H. F. Elliott ..	A. Taylor ..	Signalling with C.W. trans- mitters
1,473,417	16/6/20	F. G. Beetem ..	—	Method of controlling current to filaments of valves
1,473,674	16/12/20	L. Espenschied ..	Amer. Telephone and Telegraph Co.	Modulation with magnetic amplifiers
1,473,682	24/7/19	H. S. Osborne ..	Amer. Telephone and Telegraph Co.	Amplification of H.F. carrier currents
1,473,719	19/2/20	R. R. Beal ..	A. Taylor ..	Signalling with C.W. trans- mitters
1,473,921	13/11/23	J. Bethenod ..	—	H.F. alternators in parallel method of synchronising
1,474,293	10/11/21	F. Reynolds ..	Silica Syndicate, Ltd.	Means for supporting grid and anode of high-power valves

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- The Boy's Wireless Book.** [London : *G. Newnes.* Cr. 4to, pp. 90. Price 3s. 6d.]
- The Complete Wireless.** Michael Egan. [London : *G. Newnes.* Demy 4to, pp. 48. Price 1s.]
- The Construction of Crystal Receivers.** A. L. M. Douglas. [London : *Radio Press.* Price 1s. 6d.]
- Continuous Wave Wireless Telegraphy.** B. E. G. Mittell, A.M.I.E.E. [London : *Sir I. Pitman & Sons, Ltd.* Fcap. 8vo, pp. 120. Price 2s. 6d.]
- Crystal Receiving Sets and How to Make Them** (" Amateur Wireless " Handbook). [London : *Cassells.* Price 1s. 6d.]
- Directive Wireless Telegraphy.** L. H. Walter, M.A., A.M.I.E.E. [London : *Sir I. Pitman & Sons, Ltd.* Fcap 8vo, pp. 120. Price 2s. 6d.]
- Electrons, Electric Waves and Wireless Telephony.** J. A. Fleming, M.A., D.Sc., etc. [*Wireless Press, Ltd.* Cr. 8vo, pp. 334. Price 7s. 6d.]
- The Elements of Radio Telephony.** W. C. Ballard, Jr. [London : *McGraw-Hill Publishing Co., Ltd.* Pp. 140. Price 7s. 6d.]
- Final Digest for Wireless Students.** J. Henstock. [Glasgow : *J. Munro & Co., Ltd.* 7½" × 5", pp. 88. Price 4s. 6d.]
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BIOGRAPHICAL NOTICES

Abraham, Henri.—B. 1868. Professor of Physics in the University of Paris. President of the Société Française de Physique and of the Société Française des Electriciens. General Secretary of the International Union of Physics.

Adalsteinsson, F.—B. at Akureyri, Iceland, 1890. Inspector of Wireless Installations in Iceland. Address: Loftskjaltastodin, Iceland.

Alexanderson, Ernst Frederik Werner.—B. Upsala, Sweden, 1878. Educ. at the University of Lund, at the Royal Institute of Technology, Stockholm, and at Berlin. Entered the service of the C. and O. Electric Company, 1901. Joined the General Electric Company, 1902, later becoming Consulting Engineer to the latter concern. Chief Engineer, Radio Corporation of America, 1920. Fellow and Past President of the Institute of Radio Engineers. Originated and developed the transmitting system used extensively comprising the Alexanderson alternator, magnetic amplifier, and multiple-tuned antenna. Developed the "Barrage" receiver and other kindred inventions. Address: 66, Broad Street, New York.

Allen, Henry W.—B. 1870. Met Senatore Marconi, 1896. Assisted (1897) in formation of the Wireless Telegraph and Signal Co., Ltd., afterwards becoming secretary to that company. Secretary of Marconi International Marine Communication Co., Ltd., and Assistant Manager of Marconi's Wireless Telegraph Co., Ltd., (1900). Deputy Manager, Marconi's Wireless Telegraph Co., Ltd. (1910). Elected to a seat on the Board of each company, 1917. Joint General Manager, Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. (1919). Address: Marconi House, Strand, W.C.2.

Appleby, Thomas.—B. 1886, near Newcastle-on-Tyne, England. Arrived in America, 1888. Went to sea, 1909, as radio operator. September, 1909, in charge of United Wireless Station at Atlantic City, N.J. 1912, in charge of Wanamaker-Marconi Service between New York and Philadelphia Wanamaker Stores. 1917, commissioned in the U.S. Navy as a Lieutenant (J.G.) for Radio Engineering. Spring of 1918, established shore radio compass stations for the detection and location of enemy vessels in West Atlantic. 1919, Radio Engineer in the Office of the Director of Naval Communications. Resigned from Navy Department and entered profession of Patent Lawyer, M.I.R.E. (Amer.). Address: 5847, Ellsworth Street, Philadelphia, Pa., U.S.A.

Appleton, Edward Victor, M.A. (Cantab.), D.Sc. (Lond.).—B. Bradford, 1892. Educ. St. John's College, Cambridge. First-class Honours in Natural Science Tripos, Parts I and II (Physics). Served European War, 1914-1919, as Captain W/T, R.E. Specially interested in Thermionic Valves and Atmospheric. Lecturer at the Cavendish Laboratory, Cambridge. Original papers on Valves and Atmospheric in *Philosophical Magazine*, *Radio Review* and *Proc. Royal Society*. Member of Thermionic Valve and Atmospheric Sub-Committee, Radio Research Board, Department of Scientific and Industrial Research. Fellow of St. John's College, Cambridge. Address: St. John's College, Cambridge.

Arco, Graf Georg von.—B. Grossgörschütz, Schlesien. Educ. at Berlin University and Technical High School, Charlottenburg. 1898, Assistant to the late Professor Slaby in the department of wireless telegraphy. 1913, Doctor, University, Strassbourg. 1915, joined the Allgemeine Elektrizitäts Gesellschaft, Berlin. Manager of the Gesellschaft für Drahtlose Telegraphie, 1903. Carried out practical wireless telephony over a distance of 35 km. 1906. Address: Tempelhof, Berlin, Albrechtstrasse, 49/50.

Asano, Dr. Osuke.—B. 1859. Graduated at the Tokyo Imperial University, 1881. Honorary Professor, Tokyo University. Director of The Electrotechnical Laboratory of the Department of Communications, 1897. Retired 1919. Japanese delegate to the International Conference on Electrical Units and Standards, London, 1908. Responsible for the so-called "Telshinsho" wireless system.

Athanasiadis, Rear Admiral Constantin, H.R.N.R. B. Athens, 1878. Educ. Royal Naval College, 1892-96. Commissioned in the Navy, 1896, and after eleven years' active service became interested in wireless telegraphy. Supervised the erection of the first wireless installations in Greece. Sent to London, 1909, by his Government as the head of a mission for the construction of Greek wireless stations. On his return to Greece he was appointed head of the Radiotelegraph Service of the Navy. In 1920 he resigned his commission in the Royal Navy, and in 1921 became sole agent for Greece of Marconi's Wireless Telegraph Co., Ltd., and of the Société Anonyme Internationale de T.S.F. Address: Athenian Club, Nikis St. 45, and Adrianou St. 14.

Austin, Louis Winslow, Ph.D., D.Sc.—B. 1867. Educ. Middlebury College, Clark University, and the University of Strasburg. Assistant Professor of Physics at the University of Wisconsin, then joined the staff of the Physikalisches-Technische Reichsanstalt, Berlin. Specially interested in quantitative high-frequency measurements. Head of the U.S. Naval Radiotelegraphic Laboratory, Washington, D.C., since 1908. President I.R.E., 1914; Vice-President of the International Union for Scientific Radiotelegraphy. Address: Radio Building, Bureau of Standards, Washington, D.C.

Bangay, Raymond D.—B. Lyme Regis, 1883. Educ. Epsom College and Finsbury Technical College. Joined the Marconi Company, 1902. Spent five years in America in different branches of the Service. Returning to England, took up the study of military wireless stations. Chief of Field Station Department, Marconi's Wireless Telegraph Co., Ltd., 1914. Chief of Designs Department, 1921. Author of "The Elementary Principles of Wireless Telegraphy" and other works. Address: Gresham Cottage, Brentwood E, Essex.

Bardeloni, Colonel C.—B. in Brescia, 1871. Educ. at Milan Polytechnic and Turin Polytechnic. Organiser of the first wireless telephone experiments in the Italian Army and of radiotelegraphy for airships (1910). At present Director of the Army Wireless Telegraph Services. Member of the London International

Wireless Telegraph Conference, 1912; of the International Time Signals Conference in Paris, 1913, and of the International Radiotechnic Committee in Paris, 1921.

Beggerow, Dr. Hans.—B. 1874. Educ. University of Berlin and Freiburg-in-Breisgau. Chief adviser on Wireless Telegraphy to the German Admiralty from 1901 to 1919. Now occupied only with private scientific work. Address: Berlin, W. 15, Meierottostr. 3.

Bellini, Dr. Ettore.—B. Foligno, Italy, 1876. Educ. Naples University. Electrical Engineer to the Italian Navy, 1901. Chief of the Naval Electrical Laboratory at Venice, 1906. Carried out extensive research work in connection with Wireless telegraphy on warships and submarines. Joint inventor with Capt. Tosi, of the radiogoniometer.

Bethenod, J. F. H.—B. Lyons, 1883. Educ. Central School, Lyons. For a number of years assistant to Professor M. A. Blondel. On taking up his term of military service became associated with General Férrière, and carried out a number of researches in connection with radiotelegraphy. In 1907 became editor of *La Lumière Electrique*. Founded, with M. E. Girondeau, the Société Française Radio Electrique, of which he was technical director until 1919. Has published a large number of papers and articles on theoretical aspects of radiotelegraphy. Chevalier of the Légion d'Honneur. Member of the Société Française des Electriciens, of the American Institute of Electrical Engineers, and the Institute of Radio Engineers. Address: 15, Rue Michel-Ange, Paris.

Bhering, Francisco.—B. Uberaba, State of Minas Geraes, Brazil, 1867. Educ. various private schools and the Rio de Janeiro Polytechnic School, graduating in 1885. Professor of Geodesy in the São Paulo Polytechnic School, 1901. Under his initiation and direction survey and mapping of Brazil undertaken in unified maps, to a scale of one millimetre per kilometre. Professor of Geodesy and Astronomy in the Rio de Janeiro Polytechnic School. Director of the Technical Branch of the Telegraphs Administration. Represented Brazil as delegate at the International Telegraphic Congress, London, 1912; at the Radiotelegraphic Conference, London; and the Time Conference, 1912. Author of a number of works on civil engineering, geography and telegraphy. Address: Rua Conde de Irajá, No. 111, Rio de Janeiro, Brazil.

Binyon, Major Basil, O.B.E., M.A., A.M.I.E.E.—B. Ipswich, 1885. Educ. Leighton Park, Reading; Trinity College, Cambridge. Natural Science Tripos, 1907, and post graduate course Electrical Engineering. Appointed engineer to Cie. Generale Radiotelegraphique of Paris, 1911. Appointed General Manager Anglo-French Wireless Co. Granted commission in R.N.A.S., 1914. Appointed Officer-in-Charge Wireless Experimental Department of R.N.A.S., 1916. Promoted Squadron Commander, 1917. Awarded O.B.E. (military), 1918. Appointed Major R.A.F., M.I.R.E. Managing Director Radio Communication Company, Ltd. Director of C. F. Elwell, Ltd., Mullard Radio Valve Co., and Radio Press. Vice-Chairman, Radio Society of Great Britain. Address: 34, Norfolk Street, Strand, W.C.2; "Hawthorndene," Hayes, Kent.

Blandy, Col. Lyster Fettiplace, D.S.O., R.E.—B. 1874. Educ. Haileybury College and Royal Military Academy, Woolwich. Entered Royal Engineers, 1895; Lieut.-Col., R.E., 1921.

From 1908-12 Inspector Royal Engineers Stores at Woolwich. In the beginning of 1913 commanded the Wireless Signal Company at Aldershot. From 1914-17 in charge of Wireless Communication of the B.E.F., France. Became Chief Experimental Officer of Army Signals Experimental Establishment, 1917. Chief Experimental Officer, R.A.F., 1918, and thence transferred Controller of Communications of the Air Ministry; Head of the British Delegation to the International Technical Committee on Radio-Communication, Paris, 1921; Officer of the Legion of Honour; Chevalier of the Order of the Crown of Belgium; Mons Star with bar. Address: Naval and Military Club, London.

Blondel, André E.—B. Chaumont, France, 1863. Graduated at Paris University. Contributor to learned societies and technical journals on several subjects, including wireless telegraphy. Invented (1893) a new apparatus, which is known as the "Oscillograph," and which opened a fresh field for the study of alternating currents. Was the first to explain mathematically (1893), the effect of inertia in the shunting of alternators. Among his other activities in wireless telegraph, mention should be made of directed waves produced by a double aerial oscillating on the fifth harmonic, and also of a system of acoustically syntonic wireless telegraphy.

Blondlot, Professor Prosper René.—B. Nancy, 1849. After completing his scientific studies in Paris, returned to Nancy. Became Professor at the Faculty of Sciences. Now Hon. Professor and Correspondent of the Institute of France. Devoted considerable study to the problem of electromagnetic waves, the main object of his researches being to determine the speed of propagation of such waves. In 1891 he found for this speed the value 302,200 km. per second, and, in 1893, by another and quite different method, the value 297,200 km. per second. Has also investigated the laws of propagation of wireless waves in various media.

Bouthillon, Léon.—B. 1884. Educ. Ecole Polytechnique; the Ecole Supérieure d'Electricité de Paris and the Ecole Supérieure des Postes et Télégraphes. Engineer of Posts and Telegraphs in 1908. In 1911 was nominated Director of Service de T.S.F. de l'Administration des Postes et Télégraphes. Represented France as delegate at the radiotelegraphic conference in London, 1912. In 1920 was nominated Engineer-in-Chief of Posts and Telegraphs. Left the administration of Posts and Telegraphs for private industry. Was General Inspector of Exploitations of La Compagnie Générale de T.S.F. of the affiliated companies and associations. Was Prof. of T.S.F. at l'Ecole Professionnelle Supérieure des Postes et Télégraphes. Has been Instructor of Physics at l'Ecole Polytechnique in Paris since 1913. Member of the Société Française de Electriciens; the Société Française de Physique; the Société de amis de la T.S.F.; Fellow of the Institute of Radio Engineers; membre du Comité National Français de Télégraphies sans fil Scientifique. He has written, in collaboration with G. E. Petit, a work entitled "La Télégraphie sans Fil." He is also the author of an important treatise in 8 volumes entitled "La Théorie et la Pratique des Radiocommunications." Address: 25, Rue Boissonade, Paris.

Boys, Charles Vernon, F.R.S.—Educ. Marlborough and Royal School of Mines. Gas Referee. Author of "Soap Bubbles" and of numerous papers published by the Royal Society.

and others. Edited and compiled "Dynamometers" by the late F. J. Jervis-Smith. Officier de l'Instruction Publique (France); Hon. Member New York Academy of Sciences; also of Physical Society, Moscow; Past President Physical Society of London and Röntgen Society. Addresses: St. Marybourne, Andover; Athenæum and Royal Automobile Clubs, and 66, Victoria Street, S.W.1.

Bradfield, William Walter, C.B.E.—B. London, 1879. Entered the Wireless Telegraph & Signal Co., Ltd., 1897. Electrical assistant to Senatore Marconi all through the course of the latter's experimental work in Radiotelegraphy on Salisbury Plain during 1897. Installed the first wireless apparatus on British battleships, 1899, and later conducted demonstrations to the United States and French Governments. Chief Engineer to the Marconi Wireless Telegraph Co. of America, 1902. Deputy Manager of Marconi's Wireless Telegraph Company, and of the Marconi International Marine Communication Co., Ltd. Manager of both concerns, 1910. Elected to the Board of the two companies, 1917. Joint General Manager Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. Address: 1, St. James's Place, London S.W.

Brailard, Raymond.—B. 1888, Dept. of Jura, France. Studied engineering at the Ecole des Arts-et Métiers, Cluny, and Ecole Supérieure d'Electricité, Paris, 1907. Two years in the electrical industry. Military service at the Eiffel Tower Wireless Station, 1910. Engineer of the Société Française Radio-Electrique, 1911. Visited Belgian Congo as Chief Engineer of Wireless Telegraphy and installed the network of Congolese Station, 1911-12. Installed the station at Laeken, near Brussels. Secretary of the International Commission on Scientific Wireless Telegraphy, 1913-14. During the war attached first to the Wireless Service of the Belgian Army, then to the Wireless Station at Croix d'Hins (Bordeaux). Technical manager of the Société Indépendante de T.S.F., 1919. Author of several scientific papers. Chief Engineer of the Société Belge Radio-Electrique, and Consulting Engineer of the Belgian Congo Wireless Service. Address: 4, Rue d'Egmont, Bruxelles.

Branly, Edouard.—B. Amiens, 1844. Educ. St. Quentin College and Henry IV College, Paris. Fellow of the University, Doctor of Physical Science, and Doctor of Medicine. Some of his patents of 1890 and 1891 relate to the electrical conductivity of radio-conductors and to the operation of a local relay circuit from a distance. Officer of the Legion of Honour in recognition of the part he had played in connection with the discovery of "Wireless Telegraphy." Has constructed various independent distributing apparatus for producing telemechanical effects without wires. Elected a member of the Academy of Science, Paris, January, 1911. Address: 21, Avenue de Tourville, Paris 7e.

Bredow, Hans, Doctor.—B. 1879. Entered the service of the Telefunken Co., as an engineer in 1904, and took over the management jointly with Count Arco in 1908. In 1919 he entered the service of the State, later becoming Secretary of State directing the Telegraph, Telephone and Wireless service of Germany.

Brenot, Commandant Paul.—B. Roums, Ardèche, 1880. Educ. Ecole Polytechnique. Transferred to the Central Establishment of Radiotelegraphy. Represented wireless tele-

graphy at the International Electrical Congress at Marseille, 1908, and later collaborated with M. Blondel in various investigations into radiogoniometry, etc. Carried through some important experiments on the employment of wireless telegraphy in aircraft, 1910-11, which gained him the Cross of the Legion of Honour. During the war, whilst remaining in charge of French Colonial wireless, appointed head of the Radiotelegraphic Centre at Paris and of the Eiffel Tower Station. Left Army, 1919. Became Manager of the Société Française Radio-Electrique and of the Compagnie Générale de Télégraphie sans Fil. Address: Cie. Générale de T.S.F., 79, Bvd. Haussman, Paris (8e).

Bright, Sir Charles, F.R.S.E., M.Inst. C.E.—B. London, 1863. Educ. Lancing College and King's College. Engineer and Electrician for the construction, testing, laying and repairing of over 25,000 miles of submarine cable. Consulting Engineer. Gave special expert evidence before Inter-Departmental Cable Communication Committee (1902), House of Commons Radiotelegraphic Committee (1907), and Dominions Royal Commission (1911). Member of R.F.C. (Air) Enquiry Committee (1916), and of British Association War and Engineering Committee (1916). Official delegate at Air Conference (1920, 1922 and 1923). Contributed papers, addresses and lectures to numerous learned societies, technical journals and reviews. Represented Australia as sole delegate at the International Radio telegraphic Conference (1912). Vice-President, Radio Society of Great Britain and Institute of Aeronautical Engineers. Addresses: Leigh Grange, Tonbridge, and Athenæum Club, Pall Mall, London, S.W.1.

Brillouin, Léon Nicolas.—B. at Sevre (Seine), 1889. Pupil of L'Ecole Normale Supérieure (1909-1913). Sub-lieutenant of the 8th Engineers of l'Etablissement Central de Radiotélégraphie (1914-1919). Prof. of l'Ecole Supérieure de T.S.F. Doctor of Science (1920). Engineer of the Société Indépendante de T.S.F., Paris. General Secretary of "Journal de Physique," Paris. Membre du Conseil de Physique Solvay à Bruxelles (1920 et 1924). Membre du Comité Français de Radiotélégraphie Scientifique. Address: 30, Quai du Louvre, Paris I.

Brown, Frank James, C.B., C.B.E., M.A., B.Sc.—B. 1865, near York. Entered the Civil Service, 1886. Appointed to the Post Office. Principal Clerk, 1910. Assistant Secretary in charge of Telegraphs, March, 1919. Post Office representative on Imperial Communications Committee, and Member of Wireless Telegraph Sub-Committee of that Committee. Member of Imperial Wireless Telegraphy Committee appointed by Government in 1919 to formulate a scheme of W/T for the Empire. Expert adviser on Telegraph questions at Arms Conference, Washington, 1921-22. Member of Broadcasting Committee, 1923. Commander of the Dannebrog. Address: G.P.O., London.

Brown, Sidney George, F.R.S., M.I.E.E.—B. 1873, Chicago, U.S.A., of English parents. Educ. Harrogate and London University. Inventor and engineer. Made a special study of submarine telegraphy and is inventor of the magnifying cable relay. Invented the drum cable relay and the magnetic shunt, 1898. In conjunction with the late Sir Henry Hozier discovered the first practical methods of directional Herye waves 1899. Since that date he has also devoted much attention to telephony and wireless telegraphy. Invented microphone amplifier, loud speakers, telephone receivers, Frenophone, etc. for wireless, and the gyro-

scopic compass for use of board ship. Vice President of the Radio Society of Great Britain. Clubs: Athenæum, Royal Automobile. Address: 52, Kensington Park Road, W.11.

Bucher, Elmer E.—B. Akron, Ohio, 1885. Joined De Forest Wireless Telegraph Company as experimental engineer, 1903. Constructed several high power radio stations in Middle West and on the Gulf Coast. Joined the United Wireless Telegraph Company as construction and experimental engineer, 1904. Installed a number of ship stations for United States Government. Organized the United Wireless Telegraph Company's Instruction School, 1909. Joined the Marconi Wireless Telegraph Company as instructing engineer, 1912. Organized Marconi Institute, 1917, and acted in capacity of director. Transferred to Commercial Department, Radio Corporation of America, 1920, and appointed Commercial Engineer. Held position as Technical Editor of "Wireless Age" during the period 1913 to 1918. Author of "Practical Wireless Telegraphy," "Vacuum Tubes in Wireless Communication," "Wireless Experimenters' Manual" and other works. Appointed Manager of the Sales Department, Radio Corporation of America, 1922. Member of Institute of Radio Engineers.

Bullard, Rear-Admiral W. H. G., U.S. Navy.—B. 1866, Pennsylvania, U.S.A. Graduated, U.S. Naval Academy, 1886. Served on ships of the Navy and on shore, with particular reference to the science of Electrical Engineering, in which he had specialised. First Superintendent of the Naval Radio Service, 1912-16. Delegate of the United States at the International Conference for Safety of Life at Sea, London, 1913. During the war his sea service was in the Sixth Battle Squadron of the British Grand Fleet, serving in the North Sea. Awarded D.S.M. by U.S. Navy and made Commander of Legion of Honour (France). After the war he returned to Washington in charge of the Communication Service of the Navy Department, with the title "Director Naval Communications." Author of the "Naval Electrician's Text Book" and other publications. Clubs: Officers Club, U.S. Naval Academy; Army and Navy Club, Washington, D.C.; Army and Navy Club of America, etc., etc.

Burstyn, Dr. W.—B. Austria, 1877. Educ. Vienna University. Started his career as electrical engineer with the Schuckert-Werke, Nürnberg. Later engineer with the Siemens-Schuckert-Werke, Charlottenberg; with the Gesellschaft für Drahtlose Telegraphie and others. Wireless engineer with the Russian Navy in the Russo-Japan war, later in Turkey. Developed together with Baron Lepel (1907-12) the quenched spark system. Now Chief Engineer with the Allg. Els. Ges., Berlin. Many publications, especially regarding Wireless and electric switching, in "Jahrbuch für drahtl. Tel." etc., and other papers. Was Chief Engineer with the A.E.G. until June last. Now proprietor of a Techno-Physical Laboratory and consulting engineer. Address: Berlin—Wilmsdorf, Prinzregentenstrasse, 23.

Castañón, Lieut.-Col. Don Luis. Spanish Royal Engineers.—B. 1867. 1st Chief of Field Wireless Battalion. One of the pioneers of Wireless Telegraphy in the Spanish Army. From 1904 until 1919 in charge of Wireless affairs at the Centro Electrotécnico y de Comunicaciones de Madrid. Took part in the Mindanao, Luzon (Philippine Islands) and Spanish-American campaigns, and was seriously wounded in action.

Chaffee, Professor E. L.—B. 1885, Somerville, Mass. Educ. High School, Somerville, and Massachusetts Institute of Technology in Boston. Graduated B.S. in Electrical Engineering, 1907. Awarded the degree of M.A. in Physics, Harvard University, 1908, and Ph.D., 1911. Conducted courses in physics and radiotelegraphy at Harvard University. Engaged in research and consultation work in radiotelegraphy, Associate Professor of Physics, Harvard University. Author of several publications. Fellow Academy of Arts and Sciences (Amer.), Fellow I.R.E. (Amer.), Member Physical Soc. (Amer.), Member Optical Sec. (Amer.). Address: Cruft H. T., Elect. Laboratory, Harvard University, Cambridge, Mass.

Chamberlain, Eugene Tyler.—B. Albany, N.Y., 1856. Educ. Albany Academy and Harvard College. Graduated 1878. In business for two years, then took up journalism and acted as legislative and political correspondent to the Associated Press. Appointed Commissioner of Navigation (1893-1921). Prominent advocate of wireless telegraphy as a means of promoting safety of life on merchant vessels at sea, and has since assisted in promoting legislation on this subject. Delegate for the U.S.A. to the Convention on Safety of Life at Sea, at London, 1914. Address: Department of Commerce, Bureau Foreign and Domestic Commerce, Washington, D.C.

Chevrelière, Jean Marie Charles Aymé, Baron de la.—B. Poitiers, France, 1858. Member of Parliament, Mayor and General Counsellor. Leaving the Military Academy of St. Cyr (1879), was fifteen years in the active army as cavalry officer, retiring as captain in the Reserve, 1892. Member of Légion d'Honneur, Military class Mobilised from August, 1914 to 1917. Joined the Board of the Belgian "Société Anonyme de T.S.F.," 1901, and subsequently took a prominent part in the initiation of the "Compagnie Industrielle de Mécanique et d'Electricité," of which he is President and Managing Director. Since 1914 Vice-President of the Cie. Générale de T.S.F., Director of "Société Française Radioélectrique" and Vice-President of Cie. Radio Maritime. Also Director of "Cie. Radio France" and of "Cie. Sté. Franco Argentine." Address: The Jockey Club and Nouveau Cercle, 3 rue Keppler, Paris.

Childs, H. B. T.—B. Llandilo, S. Wales, 1884. Educ. King's School, Canterbury; London University. Joined the Marconi Company, 1905. Served as Engineer in Russia, Canada, Spain, and Egypt. Joined Royal Flying Corps, 1915. Served in France, 1915, to 1917. Appointed to command W/T Experimental Establishment, R.A.F., August, 1917. Promoted Lieut.-Col., December, 1917. Appointed in charge of W/T for the R.A.F. in France, May, 1918, till April, 1919. Mentioned in despatches, 1916, 1918. Chief of Field and Air Division, Marconi's Wireless Telegraph Co., Ltd., 1919-1923. Appointed Joint Managing Director of the Wireless Telegraph Co. of South Africa, Limited, May, 1923. Club: Junior Army and Navy. Address: Civil Service Club, Cape Town.

Chree, Charles, F.R.S.—B. 1860, Lintrathen, Forfarshire, Sc.D. of Cambridge, Hon. LL.D. (Aberdeen). Graduated M.A. Aberdeen, 1879. Ex-President of Physical Society of London; Pres. Royal Meteorological Society. Pres. Section of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Obtained Watt Medal of Institution of Civil Engineers. Largely concerned with geophysics, especially terrestrial magnetism and atmospheric

electricity. Address: 75, Church Road, Richmond, Surrey.

Coursey, Philip R., B.Sc. (Eng.)—B. 1892. Educ. University College, London. Awarded Diploma in Electrical Engineering with Distinction. Graduated with first-class Honours in Electrical Engineering at the University of London. Subsequently acted as Assistant to Dr. J. A. Fleming, F.R.S., at University College, London. From 1915-18 served as Inspector of Wireless Telegraph Apparatus for the Admiralty; afterwards appointed to the staff of H.M. Signal School, Portsmouth, as Research Physicist. Sometime Research Electrical Engineer to the Dubilier Condenser Co., Ltd, now Chief Engineer to the Dubilier Condenser Co. (1921), Ltd. Author of many papers on Radiotelegraphy and Telephony, read before a number of Societies, and of "Telephony without Wires," and of "The Radio Experimenter's Handbook" (Parts I and II), "The Wireless Telephone—What it is and How it Works," "How to Build Amateur Valve Stations," etc. Associate Member of the Institution of Electrical Engineers, Member of the Royal Institution of Great Britain. Member and Member of Committee of the Radio Society of Great Britain. Address: Stamford House, Marchmont Road, Richmond, Surrey.

Craven, Tunis A. M.—B. 1893. Lieutenant, U.S. Navy (Radio Traffic Engineer). Graduated U.S. Naval Academy, Class 1913. Radio Officer, U.S.S. "Delaware," 1913-1915. Fleet Radio Officer, U.S. Asiatic Fleet, 1915-1917. In charge U.S. Naval Coastal and Transoceanic Radio Operations, 1917-1920. U.S. Naval Representative at Provisional Inter-Allied Communication Conference at Paris, France, in 1919. U.S. Naval Radio Technical Advisor at International Conference on Electrical Communications at Washington, 1920. Was also Acting Chairman of Sub-Committee on Wavelength Allocation at this Conference. U.S. Naval Representative at Conference of Technical Committee on International Radio Communication at Paris, France, in 1921. Fleet Radio Officer, United States Fleet, 1922-1923. Radio Division, Bureau of Engineering, U.S. Navy Department, September, 1923. Clubs: Army and Navy, Ends of the Earth, U.S. Naval, Institute.

Crawley, Lieut.-Col. C. G. G., R.M.A., M.I.E.E. (ret.)—B. 1880. Educ. Dublin University and R.N. College, Greenwich. Employed at Wireless Telegraphy in the Navy, 1903 to 1913, as Experimental, Instructional, and Fleet Wireless Officer. Deputy Inspector of Wireless Telegraphy in the Post Office, 1913. Returned to the Naval Wireless service for the period of the war. Served in the Grand Fleet, in command of the R.N.V.R. Wireless School, at the Admiralty, and supervised the erection and working of various Naval stations abroad. Resumed his duties in the Post Office in 1919. Sec. to the Wireless Telegraphy Commission for planning stations for the Imperial Chain. Address: General Post Office, London, E.C.

De Forest, Dr. Lee.—B. Council Bluffs, Iowa, 1873. Graduated Ph.D. 1899. Founded the De Forest Wireless Telegraph Co., 1902, the Radio Telephone Co., and the De Forest Radio Telephone Co., 1907. As the outcome of experiments on high frequency radio currents, he evolved the audion, by inserting a grid in the two-electrode valve. M.I.E.E. (Amer.), Member of the Franklin Institute, M.I.R.E. (Amer.). Address: The De Forest Radio Telephone and Telegraph Co., Central Avenue, Jersey City, N.J.

Dellinger, J. H.—B. Cleveland, Ohio, 1886. Educ. East High School, Cleveland, Ohio, graduated 1903; Western Reserve University, Cleveland, Ohio; student 1903-07; George Washington University, Washington, D.C.; A.B. 1908. Princeton University; Fellow, 1912-13. Ph.D., 1913. Physicist in Bureau of Standards since 1907 to present time. Research on: electrical properties of copper (becoming the basis of international standard); miscellaneous mathematical and electrical subjects; electric units; science and development of radio communication. Chief of Radio Laboratory, Bureau of Standards. Author of three books on radio communication and numerous articles and treatises. Delegate of Department of Commerce at 1921 Conference in Paris of Inter-Allied Technical Committee on Radio Communication. Secretary of U.S. Government Inter-department Radio Advisory Committee 1922-3. Member of American Physical Society; Washington Academy of Sciences; American Radio Relay League, Technical Advisory Committee, and the American Radio Association Advisory Committee. Technical Secretary of American Section of the International Union of Scientific Radio Telegraphy. Address: 6607, Delfield Street, Chevy Chase, Maryland, U.S.A.

Dennerly, Alfred.—B. Marckolsheim (Bas-Rhin), 1871. Educ. l'Ecole Polytechnique. Inspector-General of Posts and Telegraphs. Director of l'Ecole Supérieure des Postes et Télégraphes; Vice-President of Technical Committee of Posts and Telegraphs. In 1904. Delegate of the French International Congress of Electricians at St. Louis (U.S.A.). Director of the Office of the Ministry of Posts and Telegraphs 1906 to 1909. Président of the Commission des Annales des Postes, Télégraphes et Téléphones. Commander of the Legion of Honour. Address: Ecole Supérieure des Postes et Télégraphes, 20, Rue Las Cases, Paris.

Desbarats, George Joseph, C.M.G., B.Sc.—B. Quebec, Canada, 1861. Educ. various Public Schools; Ecole Polytechnique, Montreal and Laval University. Engineer on construction of canals and other public works; assistant to late John Page, Chief Engineer of Canals; Inspector, Railway Construction; Acting Deputy Minister of Marine and Fisheries, Ottawa, 1908-09; Deputy Minister, 1909-10; Plenipotentiary for Canada at the Radiotelegraph Conference held at London, England, 1912. Member of the Engineering Institute of Canada, 1897; Councillor, 1907; Vice-President, 1909; Plenipotentiary for Canada to International Seamen's Conference, Genoa, 1920. Deputy Minister and Comptroller of the Canadian Naval Service since June, 1920. Address: Ottawa, Canada.

De Valbreuze, R.—B. 1877. Engineer-electrician (Ecole Supérieure Electricité Paris, 1903). Attached as Officer of Engineers to the Central Establishment of Military Telegraph Materiel. Left Army for industry. During the war was a Captain of Engineers attached to the Radiotelegraphic Centre in Paris. President for 1924 of the Société des Amis de la T.S.F., M.I.R.E., Member several French Technical Societies. Chevalier of the Legion of Honour. Address: 72, rue Bossière, Paris (xvie).

Dowsett, H. M.—B. London, 1879. Educated at the Central Foundation School, London and the Ecole Internationale, Paris. Trained as an electrical engineer at Finsbury Technical College. In 1899 joined the engineering staff of the Wireless Telegraph & Signal Co., now known as Marconi's Wireless Telegraph Co., Ltd. Was

associated with much of the early developmental work of this company, and after having erected stations ashore and afloat in many parts of the world, was appointed in charge of the test rooms and drawing office at the Hall Street Works, Chelmsford, in 1908. Has held the position of chief of the testing department of the New Street Works from 1912 to the present time. M.I.E.E., F.Inst.P., M.I.R.E. Revised the "Handbook for Wireless Telegraphists," of J. C. Hawkhead, for the second edition published in 1915, and third edition 1923, and is the author of "Wireless Telegraphy and Telephony: First Principles, Present Practice and Testing," published in 1923. Address: Marconi Works, Chelmsford, Essex.

Dubilier, William.—B. 1888 in U.S.A.—Educ. Cooper Technical Institute, New York City. President and Technical Director of the Dubilier Condenser and Radio Corporation, New York City. Technical Director of the Dubilier Condenser Co., Ltd., London. Inventor of the Ducon mica condenser; owner of over 200 radio patents and applications for radio equipment. M.I.R.E. (Amer.). Member of the Radio Club of America and of the Progress Club, New York. Address: Bronxville, New York.

Eccles, W. H., D.Sc., A.R.C.S., F.R.S.—B. Barrow-in-Furness, 1875. Entered Royal College of Science, South Kensington, in 1894. Three years later was appointed demonstrator in the Physics Laboratory at the College, and in 1898 graduated at the London University with first-class honours in Physics. In 1899 he entered Mr. Marconi's laboratory at Chelmsford and spent a great part of his time in the investigation of electrical oscillations of air wires and in "jiggers." Devised a laboratory method for testing and classifying coherers, and results of a later study of coherers were presented as one of his D.Sc. theses. In 1901 was appointed Head of the department of mathematics and physics at the South-Western Polytechnic, Chelsea, and afterwards University Reader in Graphics at University College, London. Vice-President of the Institution of Electrical Engineers, of the Physical Society, of the Institute of Physics and of the International Union of Radiotelegraphic Science; First Chairman of the Wireless Section of the Institution of Electrical Engineers; President of the Radio Society of Great Britain. Since 1916, Professor of Electrical Engineering at Finsbury Technical College, and now Dean of the College. Address: 2, Ryder Street, St. James's, S.W.1.

Echevarri, Capt. J. A. V.—B. 1897. Educated King's College School. Gazetted Sub-Lieut. R.N.V.R. January, 1916. Subsequently became Capt. R.A.F. 1918. Appointed Assistant to Head of Wireless Telegraphy Board 1920. British Delegate at International Conference on Electrical Communications, Washington, D.C., 1920, also at International Technical Committee on Radio Communications, Paris, 1921. Department of Controller of Communications, Air Ministry. Address: Junior Constitutional Club, W.1., and 22, Crescent Road, Wimbledon, S.W.20.

Eichhorn, Gustav, Ph.D.—B. Dusseldorf (Germany), 1867. Took degree of Ph.D. at Zürich University. Entered the wireless telegraph laboratory of Prof. Braun and Siemens and Halske, in Berlin. Publications: *Drahtlose Telegraphie* (Liepzig, 1904), *Wireless Telegraphy* (London, 1906), *Drahtloser Überseeverkehr* (Zürich, 1921). Returned to Zürich as the representative of the Telefunken Co., 1905, and

launched the *Jahrbuch der drahtlosen Telegraphie und Telephonie*, 1907. Engaged in practical and theoretical work in wireless telegraphy and telephony. Now in the Institut für Radiotelephonie. Address: Hauptpostfach 6123, Zürich, Switzerland.

Eisenstein, S. M.—B. Kief, Russia, 1884. Educ. Kief University. Studied at the University of Berlin and the Charlottenburg Polytechnic. First turned his attention to wireless telegraphy in 1900. Obtained his preliminary wireless patent and established a private experimental laboratory in 1904. His work received the attention of the Military Authorities, and resulted in the realisation of the formation of a wireless company. The new departure speedily justified itself, and in 1911 the original company coalesced with the Marconi Company and the reconstructed Russian Organisation, with Mr. Eisenstein as Director and Principal Technical Adviser, assumed responsibility for the development of Russian wireless. During the war, he was responsible for the erection of all high-power wireless stations in Russia and for communications with the Allies. He is also Professor at the Moscow Higher Technical College, member and Vice-President of the Russian Society of Radio Engineers, member of the Russian Technical Society, and member of the Physico-Chemical Society. He is the author of a large number of scientific papers, read before various technical societies and Congresses.

Elwell, Cyril Frank.—B. 1884. Educ. Fort St. Model Public School, Sydney, Australia; Stanford University, California (B.A. and E.E.). Chief Engineer Poulsen Wireless Telegraph and Telephone Company and Wireless Development Co., 1908; Federal Telegraph Co. 1909 to 1913, and Universal Radio Syndicate, London, 1913 to 1915. Managing Director C. F. Elwell, Ltd., since 1915. Mem. I.E.E., Mem. Am. I.E.E., Mem. Ital. I.E.E., Fell. I.Rad.E. Clubs: Royal Automobile and Engineers, London. Addresses: 12, Craven House, Kingsway, London, and 20, Great Russell Mansions, 60, Great Russell Street, London.

Erskine-Murray, James, D.Sc., F.R.S.E.—B. Edinburgh, October 24th, 1868. After six years' study and research under the late Lord Kelvin at Glasgow University entered Trinity College, Cambridge, as a research student. Assistant Professor of Physics and Electrical Engineering in the Heriot-Watt College, Edinburgh, 1896-98. Appointed experimental assistant to Mr. Marconi, 1898. Lecturer and Demonstrator in Physics and Electrical Engineering at University College, Nottingham, 1900. Lecturer in Electrical Engineering at the George Coates Technical College, Paisley, 1905. Consulting work in radiotelegraphy, 1905. Lecturer on Radiotelegraphy at the Northampton Institute, London, 1907-11. Contributed papers to numerous learned societies and technical journals. Author of several works on wireless telegraphy. Partner in the firm of Clark, Forde, Taylor, and Erskine-Murray, consulting engineers, 1913-18. Served as Lieut.-Commander during the War with the Royal Air Force in charge of the design of wireless instruments and of experimental work till May, 1922. Now Experimental Engineer at H.M. Signal School, R.N. Barracks, Portsmouth. Fellow of the Inst. of Physics; Fellow of the Institute of Radio Engineers; Member of the Inst. of Electrical Engineers. Past President of Wireless Society of London. Club, Caledonian.

Escolano Llorca, Manuel. Capt, Spanish R.E. As Lieutenant and Captain in the Military Wireless Service (C.E.T.), has contributed very largely to the development of military wireless. Marconi Engineer from Chelmsford School. At present Chief Engineer of the *Compañía Nacional de Telegrafía sin Hilos*. Contributed articles on wireless in "El Memorial de Ingenieros" (R.E. Review), Madrid. Address: *Compañía Nacional de Telegrafía sin Hilos*, Madrid.

Evans, George Robert, Captain (ret.), U.S. Navy.—B. 1863, West Fairlee, Vermont, U.S.A. Graduated from the U.S. Naval Academy, Annapolis, Maryland, 1885. Assistant Naval Attaché, American Embassy, Paris since 8th April, 1922. Has been a member of the various Inter-Allied Radio Conferences held in Paris since summer of 1917. Officer de la Légion d'Honneur. Member of Army and Navy Club, Washington.

Ewen, Harry Alexander.—B. Aberdeen, 1877. Educ. Aberdeen Grammar School; Liverpool Institute. Received Engineering training at Heriot-Watt College. Joined Engineering Staff of Marconi's W/T Co., 1902. Appointed Wireless Telegraph Expert to the Brazilian Navy, 1910; rejoined Marconi's W/T Co. as Chief of Drawing and Design Dept.; appointed Chief of Installation Design Division, 1922. Address: "Braeside," Priest Lane, Shenfield, Essex.

Ferrie, General Gustave.—B. at St. Michel de Maurienne (Savoy), 1868. Educ. l'Ecole Polytechnique, Paris. Was present in 1899 during experiments of Senatore Marconi between Wimereaux and Dover. Initiated French Military Radiotelegraphic Service in 1900. Was member of French Delegation to the International Electrical Congress of St. Louis in 1904. Member of the French Delegation to the International Radiotelegraphic Conference of London (1912). Appointed General Secretary of the International Time Conference, Paris (1913). Member of the Inter-Allied Wireless Technical Committee in Washington (1920). President of the Inter-Allied Technical Committee in Paris (1921). President L'Union Radiotélégraphique Scientifique Internationale. President of the International Commission on Longitudes. Technical Director of French Military Radiotelegraphy. Member of the Academy of Science (Paris), D.Sc. (Oxford), Commander of the Legion of Honour. Author of the first work on wireless in France, and a large number of contributions on the subject of wireless telegraphy. Address: Commandant Supérieur de Troupes et Services de Transmissions, 51 bis, Boulevard de Latour-Maubourg, Paris, 7e.

Fessenden, Reginald Aubrey.—B. Milton, Canada, 1866. Educ. New York and Port Hope, Ontario. Inspecting engineer to the Edison Company, New York. Took up teaching work and conducted classes in physics and electrical engineering at Western University, 1892. Professor of Electrical Engineering at Western University, Philadelphia, 1893. Special Agent to the U.S. Weather Bureau, 1900. Has devoted much attention to the development of a system of wireless telegraphy known by his name, and has also carried out important experiments in wireless telephony.

Field, Rear-Admiral Sir F. L., K.C.B., C.M.G.—B. 1871. Entered Royal Navy, July, 1884; promoted Lieut., 1893; qualified as Torpedo Lieut., 1896. Promoted Commander, 1902; Captain, 1907; Commanded H.M.S. "Duncan," 1910; Superintendent of Signal Schools, 1912;

Capt. H.M.S. "Vernon" (Torpedo School), 1914; Capt. H.M.S. "King George V" at Battle of Jutland; mentioned in despatches, awarded C.B. (Military division). Chief of Staff to Admiral Second-in-Command Grand Fleet, 1916. Awarded C.M.G. for this service. Director of Torpedoes and Mining at Admiralty, 1918. Promoted Rear-Admiral, 1919. Third Sea Lord and Controller of the Navy, 1920-1923. K.C.B., 1923. Rear Admiral Commanding Battle Cruiser Squadron, 1923. Member of Committee (appointed November, 1919) to advise British Government on Imperial W/T Communications. Associate Member of Institute of Naval Architects. Addresses: Admiralty, Whitehall, London, S.W.1, and United Services Club, Pall Mall.

Fisk, Ernest Thomas.—B. Sunbury-on-Thames, 1886. After two years with Messrs. Frederick Walton and Co., he entered the British Telegraph Service. Joined the Marconi Company in England (1905). Temporarily engaged in engineering branch of the American Marconi Company, erecting stations on ship and shore. Undertook a special mission to the Arctic icefields, 1909, and demonstrated the possibilities of wireless communication with Newfoundland Sealing Fleet. Visited the Antipodes, 1910, in R.M.S. "Otranto," and demonstrated the use of the Marconi apparatus for the Orient Mail Line of steamers. Again visited Australia, 1911. General Manager with a seat on the board of directors of Amalgamated Wireless (Australasia), Limited, 1913. Revisited England, 1916. Shortly after return to Australia, accepted position as Managing Director of the Company. Tested possibility of direct wireless communication between England and Australia. Gave the first public demonstration of wireless telephony in Australia before the Royal Society of New South Wales. Managing Director of the Australalectric Company, now Australalectric, Limited. Established the Australasian branch of The Wireless Press.

Fleming, John Ambrose, D.Sc., M.A., F.R.S.—B. Lancaster, 1849. Educ. University College School, London; University College; R. School of Mines. Sometime Fellow of St. John's College, Cambridge; Fellow and Hughes Gold Medallist, Royal Society. Lecturer in Mechanics and applied science, Cambridge University (1880). First Professor of Mathematics and Physics (1881), University College, Nottingham. First occupant of Pender Chair of Electrical Engineering, University College, London (1885). Vice-President of Radio Society of Great Britain. Sometime Vice-President of Institution of Electrical Engineers and Physical Society. Honorary Member of the Institution of Electrical Engineers. Honorary Member of the Royal Engineers Institute, Chatham. Scientific Adviser to the Edison and Swan United Electric Light Company, 1882-93. Scientific Adviser to the London Electric Supply Corporation, and many other corporations, firms and companies in electrical matters. Publications: Numerous contributions to scientific literature and research. Author of well-known text-books, particularly on wireless telegraphy. Widely known as the inventor of the Thermionic Valve or Fleming Valve. University Professor of Electrical Engineering, University of London (1912). Address: The Pender Electrical Laboratory, University College, Gower Street, London, W.C.1.

Forberg, Olaf E.—B. 1871, in the Province of Finmark, Norway. Early attached to the Norwegian Telegraphic Service. Erected several new telegraphic plants in Norway, 1893-1904.

Went to Iceland on an inspection, 1905, and in 1906 he constructed the telegraphic line from Reykjavik to Seydisfjord. Superintended the erection of stations and organisation of the telegraphic system in Iceland. Director of Telegraphs in Iceland, 1907; now controls both the wired and wireless nexus of the island. Member of the Engineers' Association of Iceland. Knight of Dannebrog, 1907. Address: Director of Telegraphs, Reykjavik, Iceland.

Fortescue, Cecil L.—B. 1881. Educ. Oundle School and Christ's College, Cambridge. Engineering training with Messrs. Siemens Dynamo Co., Stafford, 1903-06. Civilian Instructor in Applied Mechanics and Electro-Technics at H.M. Gunnery and Torpedo Schools, Portsmouth, 1906. During the war attached to Wireless Telegraphy Department, H.M.S. "Vernon," and at H.M. Signal School, Portsmouth. Professor of Physics, Royal Naval College, Greenwich, January, 1911, to August, 1922; since then Professor of Electrical Engineering, City and Guilds (Engineering) College, M.I.E.E., serving on Committee of Wireless Section of that Institution. Fellow of the Institute of Physics. Member of the Physical Society of London, serving on the Council. Member of Sub-Committees "D" and "D1" on Thermionic Valve of Radio Research Board, of the Department of Scientific and Industrial Research. Address: City and Guilds (Engineering) College, Exhibition Road, S.W.7.

Franklin, Charles Samuel.—B. 1879. Received engineering and scientific training at Finsbury Technical College. After some time spent in electrical work, first at Manchester and afterwards with the Norwich Electricity Company, joined Marconi's Wireless Telegraph Company (then known as the "Wireless Telegraph and Signal Company"), 1899, and still remains in their service. He has during recent years been engaged in conducting experimental and research work on behalf of Senatore Marconi, and has a number of important patents to his credit.

Frouin, M.—General Inspector of French Telegraphs. President of French Délégation at the International Radiotelegraphic Conference, London, 1912. Address: 6, Rue Joseph Baron, Paris 6e.

Furnival, John Megarry.—B. 1892. Educ. Leek High School and Longton High School, Stoke-on-Trent. Apprentice engineer (Messrs. Hartley, Causton & Richmond, Ltd., Stoke-on-Trent), 1909-11. Inspector, National Telephone Co., Hanley, 1913. Testing Engineer Messrs. Siemens Bros. & Co., Ltd., Woolwich, 1914. Served as Wireless Officer, R.A.F., during the war. From December 15th, 1915, to April, 1919, engaged on the development of Wireless Telephony for aircraft communications. Awarded M.B.E. and twice mentioned in despatches. Retired in April, 1919, with rank of captain. Joined Marconi's Wireless Telegraph Co., Ltd., 1919. Appointed Chief of Field and Air Division of that Company, May, 1923. Club: Junior Army and Navy. Address: Marconi House, Strand.

Gardiner, B. C.—B. 1879. Educ. at Marlborough College. Joined Royal Marines 1897. Supervised the erection of Bermuda Wireless Station 1907. Senior Instructor of Wireless Telegraphy at the Royal Naval Electrical School, H.M.S. "Vernon," 1910. Attached R.E. as the Instructor of Wireless Telegraphy at the Army School of Military Engineering, Chatham, 1913. Wireless officer on the staff of Lord Jellicoe 1914-1916. Fleet wireless officer

on the staff of Earl Beatty 1916-1918. Awarded Brevet Lieut.-Col. and C.B. Head of the Wireless Telegraphy Board 1920. Admiralty representative at the Allied Conference on Electrical Communications at Washington 1920 and at Paris 1921. M.I.E.E. United Service Club. Address: At. Albans Priory, Wallingford.

Girardeau, Emile.—B. 1882. Educ. Ecole Polytechnique. Joined the Army and served as an officer in the Engineers. Managing Director Cie., Générale de Télégraphie Sans Fil, Cie Radio-France, Société Française Radio-Electrique. Director of Radio-Maritime, Sté Anonyme Internationale de T.S.F. (S.A.I.T.), Sté. Radiotechnique, Sté Radio Romana, etc., etc. Author of various works on a number of subjects relating to wireless telegraphy. Member of Légion d'Honneur. Address: 98 bis, Boulevard Haussmann, Paris (8e).

Glazebrook, Sir Richard Tetley, Kt., K.C.B., M.A., D.Sc., F.R.S.—B. Liverpool, 1854. Educ. Trinity College, Cambridge. Fifth Wrangler. Studied Physics as Graduate at the Cavendish Laboratory, Cambridge, under Clerk Maxwell and Lord Rayleigh. Fellow of Trinity College, Cambridge (1877). Principal of University College, Liverpool (1898-99). First Director of the National Physical Laboratory (1899-1919). Chairman of the Aeronautical Research Committee. Zaharoff Professor of Aviation and Director of the School of Aeronautics, Imperial College, 1920-23. Past President of the Institute of Electrical Engineers. Medal of the Royal Society of Arts (1918). Member of Technical Committee inquiring into Imperial Wireless scheme. Publications: Numerous works on Physical Optics, Heat, Light, Mechanics and Electricity, as well as numerous papers in Scientific Journals. Hon. Member Inst. C.E. Life Member Inst. Mech.E. Address: 5, Stanley Crescent, W.11.

Goldsmith, Prof. Alfred N., B.Sc., Ph.D.—B. New York City, 1887. Educ. Coll. of the City of New York, 1907; Ph.D. Columbia Univ., 1911. Consulting Radio Expert, U.S. Department of Justice, 1912. Consulting Radio Engineer Atlantic Communication Co., 1914. Consulting Engineer General Electrical Co., 1915-17. Director of Research, Marconi Wireless Telegraph Co. of America, 1917-19. Associate Professor in charge of electrical engineering, College of City of New York, since 1919. Director of Research Department, Radio Corporation of America since 1919. Editor, "Proceedings of the Institute of Radio Engineers," since 1912. Member U.S. Federal Radio Telephone Commission, 1922 and 1923. Made investigations in simplex and duplex radio telegraphy and telephony, transmission of canal rays, precision measurements in radio engineering. Author, "Radio Telephony" (Wireless Press), 1918, "Radio Measurements," "Radio Frequency Changers" (Proceedings of the Institute of Radio Engineers), 1915, "World Communication" (Journal of the American Institute of Engineers), 1921. "Radiophone Reception," 1923. Technical Director U.S. Signal Corps School of Communication, 1917-18, U.S. Naval Radio School, 1917-18. Fellow, A.I.E.E., I.R.E., hon. member Radio Club of America, Radio Society of Great Britain, American Physical Society. Club: the Static. Addresses: The College of the City of New York, and 450, West End Avenue, New York, N.Y.

Gordon-Thomsen, Wm.—B. Copenhagen, 1867. Civil Engineer, 1895. Engineer in the Telephone Company of Jutland from 1896, and later Chief

of the Technical Department. Chief of the Technical Department in the State Telegraph Board, 1910. Representative of the State Telegraph Board at the office of the Commander-in-Chief for Jutland-Funen, 1903-10. Representative of the Telegraph Directory at the Chief Military Command in Copenhagen, 1911-17. Member of the Radio Telegraph Commission of 1920. Inspector of Wireless Installations from 1923. Knight of Dannebrog. Address: Osterbrogade 19, Copenhagen O, Denmark.

Gottwaldt, Commander B. L.—B. Christiania, 1880. Entered Naval Academy, Norwegian Navy, 1898. Graduated sub-lieutenant, 1901. Studied electrical engineering, telegraphy, telephony and wireless telegraphy at the Technical College, Charlottenburg. In charge of W/T in the Royal Norwegian Navy, where he was responsible for the erection of naval, land and ship stations, 1909. Appointed Commander, 1912. One of the Norwegian delegates at the International Radio Conference in London, 1912. Late Inspector of W/T, Norwegian Nav. Department. Technical Manager, Norwegian Wireless Company (Norsk Marconikompani). Address: 15, Baldersgate, Kristiania.

Grattan, Commander Ernest Loftus Colley, R.N. (Ret.), D.S.O.—B. 1884. Educ. Dublin, Stubbington House, Fareham. Promoted Sub-Lieut. in the Navy 1904, Lieut. 1905, submarines 1906, Lieut.-Commander 1913. Lent for special service at Gallipoli for wireless telegraphy and signal stations; W.T. stations at Malta, 1916; Admiralty in charge shore W.T. and signal stations, 1918; Act. Commander July, 1918; retired 1921; Assist.-Inspector of W.T., G.P.O., 1921. Address: Nutfield, Ascot.

Gray, Andrew, A.G.T.C.—B. Glasgow, 1873. Educ. Glasgow University; Royal Technical College. Diploma of latter in electrical engineering. Served as assistant to late Professor Andrew Jamieson, of Royal Technical College. Joined the West India and Panama Telegraph Company, Ltd. (1893). Entered Marconi Company, 1899. Introduced Marconi system to Hawaiian Islands. Organised telegraph working and training of native operators of Inter-island Telegraph Company of Honolulu. Appointed Chief of Staff to the Marconi Company in 1901, and in that capacity organised the working of the ship and shore wireless service; designed the original $1\frac{1}{2}$ kw. Ship Set, and supervised the ship and shore operating until 1906, when the engineering and traffic work were separated. Chief Engineer of the Marconi Parent Company since 1910, and Joint General Manager since 1923. Address: 78, Creffield Road, Acton, W.3.

Gredsted, M.—B. Copenhagen, 1873. Telegraphist in the Government Telegraph Service, 1895. Chairman of the Telegraph-Examination Board, 1917. Chief of Wireless Instruction, 1923. Inspector of Wireless Installations from 1923. Delegate of International Telegraph Conferences, Paris 1920, and Riga 1921. Knight of Dannebrog. Address: Vesterbrogade 40, Copenhagen B, Denmark.

Guthrie, Frederick Preston.—B. August County, Virginia, 1891. Educ. Chamberlain-Hunt Academy, Port Gibson, Miss. Graduated from Washington Lee University, A.B. Degree, 1911. Vanderbilt Fellow in Astronomy, University of Virginia, 1911-12. Professor of Science, Miami Military Institute, Germantown, Ohio, 1912-13. Assistant Professor of Physics. The Citadel (the Military College of South

Carolina) Charleston, S.C., 1913-17. Enlisted in South Carolina Naval Militia, 1915; promoted to Lieutenant, 1916; called to active duty in U.S. Navy, 1917, remaining on active duty until 1919; served at Charleston Navy Yard and in office of Director Naval Communications, Navy Department, Washington, D.C.; 1919, assigned to duty with United States Shipping Board Emergency Fleet Corporation by order of Secretary of Navy, to organise Radio Service. Became District Manager for Radio Corporation of America with headquarters in Washington, D.C., 1923. Member of American Delegation to meeting of Technical Committee on International Radio Communication, which met in Paris, 1921. Member of Inter-Department Advisory Committee on Government Radio Broadcasting, 1922 and 1923. M.I.R.E. Author, Communication Regulations, U.S. Navy, 1918. Address: 1110, Connecticut Avenue, Washington, D.C.

Hammond, John Hays, Jr.—B. San Francisco, Cal., 1888. Educ. Sheffield Scientific School (Yale), 1910; Sc.D., George Washington University. Inventor of type of torpedo for coast defence, controlled by wireless energy from coast fortifications. Invented system of automobile torpedo firing type, in latest battle-ships of U.S.; also aluminothermic incendiary projectiles employed by Allied armies in the Great War; and a radio system of control of ships, employed on U.S.S. "Iowa," for target practice. Has applied for over 224 patents in U.S. and Europe, relating to radio telegraphy and telephony and wirelessly controlled torpedos. Consulting Engineer the Radio Corporation of America; and also member of Board of Directors of that company. U.S. delegate Radiotelegraphic Convention, London, 1912. M.I.R.E. America (ex-Treasurer, etc.). Fellow, American Geographical Society, Associate Member American Society M.E. Member Royal Society of Arts, London. Clubs: Eastern Yacht, Yale, Engineers, University. Home: Gloucester, Mass.

Harbord, James G.—Major-General (Ret.).—B. Bloomington, Ill., 1866. Graduated Kansas State Agricultural College, 1886. Served with U.S. Army as 2nd Lieut. 1891. Service in Cuba, Porto Rico and the Philippines, covering some 16 years, during which period he won many distinctions. Appointed Lieut.-Col. 1917, and accompanied Gen. Pershing to France as Chief of Staff, serving in this capacity during the period of organisation of the A. E. F. Commanded the Marine Brigade of the Second Division in the Verdun Sector, and during the fighting in the Bois de Belleau, Bouresches, and near Chateau Thierry. Promoted Major-General of the National Army, 1918, and commanded the Second Division at Soissons. Returned to U.S. 1919, and promoted Major-General U.S. Army. Deputy Chief of Staff U.S. Army. Elected President Radio Corporation of America January 1st, 1923.

Harrison, Lieut.-Col. Norman, C.M.G., D.S.O., M.I.E.E.—B. 1873. Educ. in Natal. Served in South African War and European War, 1914-19, as Director of Army Signals in German South-West Africa, and as Assistant Director of Army Signals, and Commanding South African Signal Units (attached to Corps of Royal Engineers) in France, 1916-19. Engineer-in-Chief of Posts and Telegraphs, Union of South Africa since 1910 to 1921. Under Secretary 1922 to date. Addresses: (1) G.P.O., Pretoria; (2) Pretoria Club, Pretoria; (3) Civil Service Club, Capetown.

Hogan, John V. L.—B. Philadelphia, Pa., U.S.A. Educ. Sheffield Scientific School, Yale University. Assistant to Dr. Lee de Forest, 1906-1907. Joined National Electric Signalling Co. at Brant Rock, Mass., 1909. Telegraph Superintendent, 1910-11. Chief of Operating Inspection and Erection, 1911-14. With International Radio Telegraph Co. (successor of National Electric Signalling Co.), as Chief Research Engineer, 1914-17. Commercial Manager, 1917-18. Manager, 1918-21. Now Consulting Engineer, specialising in radio, acoustics and patent matters. Fellow, Manager and Past-President, Institute of Radio Engineers. Member, American Institute of Electrical Engineers, American Association for Advancement of Science, Radio Club of America, and other technical societies. Author of several books, articles and treatises on wireless telegraphy and telephony. Address: 41, Park Row, New York City, U.S.A. Residence, Forest Hills, Long Island, N.Y.

Holmstroem, J. Gunnar.—B. Stockholm, 1874. Passed through Poly. Acad. Stockholm, 1896. Assistant Royal Swedish Telegraph Dept., 1892. Teacher at Swedish Artillery and Engineers' College, 1904, and College for Naval Officers, 1908. Director of Radiotelegraphic Instruction, Stockholm, Kt. of "Vasa" Order. Address: Malmskillnadsgatan 19 B, Stockholm.

Hooper, Commander Stanford C., U.S. Navy.—B. 1884, Colton, Cal. Educ. at San Bernardino, California. Started his career as telegraph operator in the Southern Pacific Company. Entered the Naval Academy, Annapolis, Md., 1901. Graduated 1905. Served as midshipman on the cruiser "Chicago," destroyer "Perry," and monitor "Wyoming." Lieutenant 1910, Lieutenant-Commander 1915, Commander 1918. Instructor of electrical engineering, physics, and chemistry at the U.S. Naval Academy, 1910-11. Fleet Radio Officer of the United States Atlantic Fleet, 1912-13. Early in the war acted as observer in Europe. In charge of the Radio Division Bureau of Steam Engineering, Navy Department, 1915-17. Commanded the destroyer "Fairfax" in the Atlantic during 1917-18, then returned to take up duties as Chief of Radio Development in the Bureau of Engineering attached to the U.S. Navy. On duty as Radio Officer U.S. Fleets, on board U.S.S. "Seattle," beginning August 4th, 1923. Address: Navy Dept., Washington, U.S.A.

Hope-Jones, Frank.—B. 1867. From 1890 to 1895 associate with his elder brother, Robert Hope-Jones, in some of his earliest applications of electricity to organ-building. Has established the business of electric time service on a scientific basis. M.I.E.E. Vice-Chairman of the British Horological Institution. Chairman, Radio Society of Great Britain, and Liveryman of the Worshipful Company of Clockmakers. Author of numerous contributions to technical journals and to the Proceedings of Scientific Societies. Address: 32 and 34, Clerkenwell Road, E.C.1.

Howe, Prof. George William Osborn, D.Sc.—B. 1875, Charlton, Kent. Educ. the Roan School, Greenwich, Woolwich Polytechnic, Durham University. Nine years with Siemens Bros., at Woolwich, and Siemens and Halske, at Charlottenburg. Lecturer and later Assistant Professor of Electrical Engineering at the City and Guilds Engineering College, South Kensington. Head of the Department of Electric Standards and Electric Measurements at the National Physical Laboratory, 1921. Appointed in the same year to James Watt Chair of Electri-

cal Engineering in the University of Glasgow. D.Sc. of Durham, Hon. D.Sc. of Adelaide University. Whitworth Scholar. Has read several papers on Radiotelegraphy before the Royal Society, the British Association, the Physical Society, etc. Awarded the silver medal by the Royal Society of Arts (1912) for his paper on "Some recent Developments in Wireless Telegraphy." Vice-President of the Physical Society. Member of the Radio Research Board. Chairman of the Wireless Section of the Institution of Electrical Engineers. Address: The University, Glasgow.

Hoyle, Lieut. Bertram, M.Sc. Tech.—B. Oldham, 1888. Educ. College of Technology Manchester, and at the Victoria University Manchester. In 1907 he obtained the Certificate and Diploma in Technology and M.Sc. (Tech.) of Victoria University. Served with Messrs. Henry Simon, Ltd., Manchester, and with Messrs. S. Z. de Ferranti, Ltd., Hollinwood. Assistant Lecturer and Demonstrator in Electrical Engineering at the College of Technology, Manchester, 1911. Had charge of the design and erection of the wireless station with which the School of Technology is equipped. Enlisted early in 1915 as a motor cycle despatch rider, and served on the Western Front. In September, 1915, gazetted Lieut. R.N.V.R. In 1922 embarked upon private wireless research. Author of "Standard Tables and Equations," an a number of technical essays and monographs. Address: 18, King's Drive, Heaton Moor, near Stockport.

Isaacs, Godfrey C.—Educ. England, France and Germany. Began life in his father's business and later became manager. Now Deputy-Chairman and Managing Director of Marconi's Wireless Telegraph Co., Ltd., and Managing Director of the Marconi International Marine Communication Company, Limited. Address: Lyne Grove, Virginia Water, Surrey.

Isbell, Arthur A.—B. 1875 in the U.S.A. Entered service of original De Forest Wireless Telegraph Company, New York, in 1902. Later associated with Professor R. A. Fessenden for three years in numerous experiments in U.S.A. and Scotland. In 1908 built semi-high power station in Hawaiian Islands, and established first wireless communication between the Islands and the United States. In 1910 erected first wireless station at Wellington, New Zealand. Built Alaskan Circuit for Marconi's Wireless Telegraph Company of America. 1917-1918, Expert Radio Aid, Navy Department, Washington, D.C. Manager Pacific Division, Radio Corporation of America, San Francisco.

Jackson, Admiral of the Fleet Sir Henry Bradwardine, G.C.B., K.C.V.O., D.Sc., LL.D., F.R.S.—B. Barnsley, 1855. Educ. Chester and Stubbington. Entered Royal Navy, 1868. Capt. 1896; Rear Admiral, 1906; Controller of Navy, 1905-08; Commanded 6th Cruiser Squadron, 1908-10; Chief of Naval War Staff, 1912-14; First Sea Lord, May, 1915-December, 1916; President R.N. College, Greenwich, 1917-19. Hon. Vice-President of Inst. of Naval Architects. Past-President of Radio Society of Great Britain. Chairman of Radio Research Board. M.I.E.E., Hon. D.Sc. Leeds and LL.D. (Cantab.). Whilst Commander of H.M.S. "Edinburgh," in 1893, conceived the idea of using Hertzian waves for naval signalling purposes. Continued to take much interest in the development of W/T, and assisted in its organisation in the Navy. Addresses: 37,

Catherine Street, London, S.W.1, and The Athenæum Club.

Janet, Paul.—B. 1863, Paris. Studied at the Lycée Louis-le-Grand and the High School. Member of the French Society of Physics, the French Society of Electricians, and the Society of Civil Engineers of France. Professor of Physics at the University of Grenoble, 1886-94. Member de l'Institut. Professor of University of Paris, Director of the Central Laboratory and of the High School of Electricity. Author of several important works. Address: Ecole Supérieure d'Electricité, 12 and 14, Rue de Staël, Paris (xve).

Jenner, Axel.—B. 1885. Assistant in the Swedish Telegraph Service 1905. Passed the course for superintendents of the wireless stations 1916. 1916-1922 superintendent of the wireless station at Boden. Since 1922, superintendent of the Wireless station at Vaxholm, Sweden. Address: Boden, Sweden.

Jouaust, Raymond.—B. 1876. Ingenieur Diplome de L'Ecole Supérieure d'Electricite de Paris. Chief Engineer of the Laboratoire Central d'Electricite and Ingenieur a L'Etablissement Central du Materiel de la Radiotélégraphie Militaire. Member of Société Française de Physique, de la Société Française des Electriciens. Secrétaire Général du Comité Français de Radiotélégraphie Scientifique. Address: 13, Boulevard St. Michel, Paris.

Kajima, Akira.—B. Tokyo, 1883. Graduated from the Greek Catholic Mission School, Tokyo, 1904, and became publisher of a religious magazine. Interpreter at the French Embassy from 1905 to 1906. Joined the editorial staff of the *Chuo Shinbun* in 1906, and that of the *Kokumin Shinbun* in 1908. Established the Japanese Wireless Press Agency in 1911; Managing Director the Nippon Radio Telegraphy and Telephony Co., Ltd., 1920. Address: 46, Kobinai-Daimachi 1-chome, Koishikawa, Tokyo.

Kellaway, Rt. Hon. Frederick George.—B. Bishopston, Bristol, 1870. Educ. Bishopston, Bristol. P.C. 1920. Parliamentary Secretary Ministry of Munitions, 1916. Deputy Minister of Munitions, 1918. Secretary to Department of Overseas Trade, 1920. Postmaster-General, April, 1921. Member of Parliament, Coalition Liberal, Bedford, from December, 1910 to November, 1922. Joined Board of Marconi Wireless Telegraphy Co., November, 1922. During his term of office as P.M.G., was responsible for the institution of Broadcasting and Wireless Telephony.

Kennedy, Sir A. B. W., F.R.S.—B. London, 1847. Some time President of the Institution of Civil Engineers, and the Institution of Mechanical Engineers. Professor of Engineering at University College, London, 1874-89, and founded there the first "Engineering Laboratory." Designed electric lighting and power stations for many companies and corporations, and has also been engaged in railway and constructive work. Knighted 1905 for his services to the Admiralty. Member of the Technical Committee appointed by the Postmaster-General to consider the Imperial Wireless Scheme. Associate Member of the Ordnance Committee. Consulting Electrical Engineer to the L.N.W.R., L.S.W.R., S.E.&C.R., and the London County Council. Chairman of the Electn. of Railways Advisory Committee (Ministry of Transport). Addresses: A, 7 The Albany, Piccadilly, and Broadway Court, S.W.

Kennelly, A. E.—B. Colaba, Bombay, 1861. Educ. in England, Belgium, France and Italy. Past-President of the American Institute of Electrical Engineers, Past-President of the American Association of Illuminating Engineers; President, in 1916, of the Institute of Radio Engineers; Vice-President of the International Electrical Congresses, Paris and Turin. Left school in 1875 to become a telegraph operator in the Eastern Telegraph Company. Chief Electrician on Cable Ship, 1881. Principal electrical assistant to Thomas A. Edison, 1886-92. Consulting Engineer in Philadelphia. In partnership with E. J. Houston, of the Thomson-Houston Company, 1893-1900, Engineer-in-Chief when the cables were laid from Vera Cruz to Campeche, 1902. Professor of Electrical Engineering at Harvard University since 1902 and also at Massachusetts Institute of Technology since 1914. Director of Research Division of the Electrical Engineering Department, Massachusetts Institute of Technology, and Fellow of the American Academy of Arts and Sciences. Has written twenty-five books as author or collaborator, and more than 120 scientific papers. Some time Chairman and Secretary of Standards Committee, American Institute of Electrical Engineers, President and Secretary of the American Committee of the International Electro-Technical Commission. Member National Ac. Sciences. A delegate to the Inter-allied Radiotechnical Committee in Paris, 1921. Has specialised in alternating currents. Address: Harvard University, Cambridge Mass, U.S.A.

Kift, A. A.—B. London, 1881. Educ. City of London School and Finsbury Technical College. Joined Marconi Company, 1902. Acted as erecting engineer supervising the installation of many of the earlier ship stations, including those on board the first vessels of the White Star fleet to be equipped. In charge of the installation of the Post Office Wireless Stations at Lochboisdale, Tobemory and Bolt Head. Chief of the Estimating Department at Marconi's Wireless Telegraph Company, 1911. Chief of the Sales Department, 1921. Address: Marconi House, Strand, W.C.2.

Kolster, Frederick A.—B. Geneva, Switzerland, 1883. Educ. Public Schools of Cambridge, Mass., and at Harvard University. Assistant to John Stone Stone, 1902-08. Assistant to Lee De Forest, 1909-12, Chief of Radio Section Bureau of Standards, 1912-21, since when Consulting Engineer, Federal Telegraph Co. Attaché to American Delegation representing the U.S. at London International Radio Convention, 1912. Inventor of Kolster decimeter, radio compass and position finder, Directional Radio Systems, and other devices. Fellow I.R.E. (Amer.), Member I.E.E. (Amer.), Fellow G.S. (Amer.). Address: Cosmos Club, Washington, D.C.; Engineers Club, San Francisco, Cal.; or c/o Federal Telegraph Co., Palo Alto, California, U.S.A.

Koomans, Nicholaas.—B. 1879, at Delft. Studied at Delft for mechanical and electro-technical engineer, obtaining his certificate 1901. Entered the Government Telegraph Service. Grad. 1908 at Technical High School at Delft as Doctor in Technical Sciences. Joint-founder and editor of the Monthly Review of Telephony and Telegraphy. Joint-founder and member of the managing board of the Dutch Society for Radiotelegraphy (Nederlandsche Vereeniging voor Radiotelegrafie). Member of the International Electro-technical Commission. Member of State Patent Office. Professor in Physics and

Theoretical Electrical Engineering at the school of the Dutch Post and Telegraph Administration. Supervises the instruction of all the higher officials. Address: Willem de Lwijgerlaan 133, The Hague, Holland.

Korn, Professor Arthur.—B. Breslau, Germany, 1870. Studied at Leipsic and Paris. Professor of Physics, University of Munich, 1903-08. Best known as the inventor of a system of telegraphic transmission of photographs, and in 1907 the first photograph was transmitted under this system from Munich to Berlin. Inventor of a system of telautography and wireless phototelegraphy. Author of several mathematical works of a mechanical theory of gravitation and electricity. Professor at Polytechnical High School, Charlottenburg, Berlin. Address: Charlottenburg, Berlin Schlüterstrasse 25.

Koto, Major-General, Teizo.—B. Yamaguchi Prefecture, 1873. Entered the military service as cadet in the 6th Engineering Battalion, 1892, and promoted to 1st Lieutenant, 1898. Entered the Technical College of the Tokyo Imperial University as a special student of School of Artillery and Engineering, 1900, and graduated therefrom, 1903. Served in the Russo-Japanese War as the chief of the Field Telegraphy Corps, 1904. Promoted Major and appointed an Inspector of the Military Technical Department, 1905. Appointed Member of the Military Wireless Investigation Committee, 1910. Proceeded to China for the erection of a radio station on Chinwangtao, 1912. Promoted Colonel and Chief of the Communications Department of the Tsingtau Garrison, 1915. Promoted Major-General and Military Engineer, 1919. Connected with the Japan American Radio Telegraph Co. and commissioned by Formosa Government, 1923. Address: 68, Tani-Machi, Ichigaya, Ushigome, Tokyo.

Krarup, T. F.—B. Copenhagen, 1868. Lawyer 1891. Head clerk to Criminal Judge at Frederiksberg, 1891. Assistant in the Ministry of Home Affairs, 1894. Assistant to Copenhagen Harbour Administration, 1896-1907. Chief of Ministry of Public Works, 1912. Vice-President of the Electricity Commission, 1907; Chairman from 1916. Chairman of the Cement Commission, 1917. Member and Secretary of the Telephone Commission of 1917, from 1917; Chairman from 1920. Chairman of the "Gudena" Commission and other Commissions concerning water power plants, 1918, and of the Commission regarding Long Distance Radio Telegraph Stations. Knight of Dannebrog. Director-General of Telegraphs and Telephones, 1923. Address: Frederiksberg Allé 55, Copenhagen V, Denmark.

Lagorio, E., Capitaine de Vaisseau.—B. 1869. Attached to Sous-Sécretariat des Postes et des Télégraphes as Director of Service de la T.S.F. (16th June, 1920). Address: Service de la T.S.F., 5, Rue Froidevaux, Paris.

Latour, Marius.—B. 1875, in France. Educ. University of Paris and Ecole Supérieure d'Electricité, Paris. For many years Consulting Engineer to the General Electric Co., at Schenectady, N.Y. His numerous inventions include improvements in dynamo-electrical machinery and several types of A.C. motors bear his name. Invented the high-frequency alternator with reduced number of stator slots known as the S. F. R. alternator, installed at numerous medium and high power stations, including Lyons, Coltano and Ste. Assise.

During the war engaged in research work at the laboratories of the Etablissement Central de la Télégraphie Militaire under Général Ferrié. His system of elimination of interference produced in telephone lines by neighbouring high-tension power lines has been installed throughout the whole of Northern France. Has specialised in the development of high and low frequency thermionic amplifiers. Fitted the Ste. Assise high power station with his system of balanced multiple earth leads. Consulting Engineer to the Société Française Radio-Electrique, Paris; Ateliers de Constructions Electriques, Jeumont; Compagnie Française de Radiophonie, Paris; and Liaisons Télégraphiques and Téléphoniques (L.T.T.) Conflans Ste. Honorine. Member International Union of Scientific Radiotelegraphy-Ch valier de la Légion d'Honneur. Vice-President of the Société Française des Electriciens. Member of the American Institute of Electrical Engineers. Member of the Institute of Radio Engineers. Head Lecturer at the Ecole Supérieure d'Electricité, Paris. Address: 8, Square Desaix, Paris—XV.

Listrom, Axel Sigurd.—B. Falun, Dalecarlia, 1881. Entered the Telegraph Service, 1900. Inspector of Wireless Installations, 1913. Chief Engineer at the Radio Division of the Royal Telegraph Administration, Stockholm, 1920. Address: Frejgatan, 58, Stockholm.

Ljungqvist, Seth.—B. Falun, Dalecarlia, Sweden, 1880. Passed Maturity Examination, 1899, and Examination of Electro-Technical Branch, Technical University, Stockholm, 1904. Entered the Telegraph Service, 1899. Chief of the Radio Division in the Royal Swedish Telegraph Department, Stockholm, 1916. Address: Vanadisvägen 23, Stockholm.

Lodge, Sir Oliver, D.Sc., F.R.S., Hon. Sc.D. Cantab., Hon. D.Sc. (Oxon.), Hon. LL.D.—B. Penkhull, Staffs, 1851. Educ. at Newport (Salop) Grammar School; Entered University College, London, 1873. Graduated D.Sc. 1878. Reader in natural philosophy at Bedford College for Women, and Assistant Professor of Physics in University College, London, for several years, and Professor of Physics at University College, Liverpool, 1881-1900. The First Principal of Birmingham University, 1900. Knighted 1902. Retired 1919. Original investigations on lightning, the seat of the electromotive force in the voltaic cell, the phenomena of electrolysis and the speed of the ion, the motion of the ether near the earth, and electromagnetic waves and wireless telegraphy. His patent (1897) for syntonic wireless telegraphy was extended for seven years by Lord Parker, and was acquired by the Marconi Co. in 1911. Has held the position of President of the British Association, President of the Physical Society, and of the Society for Psychical Research. Has made many important contributions to the literature of science, amongst which are "Modern Views of Electricity" (Macmillan), "Electrons" (Bell), "The Ether of Space" (Harper's), "Mechanics" (Chambers). Clubs: Athenæum, Author's. Address: Normanton, Lake, Salisbury.

Loring, Commander F. G., R.N.—Inspector of Wireless Telegraphy General Post Office. Entered the Navy in 1882 (retired 1910). In charge of Admiralty shore wireless stations 1902-08. Admiralty delegate at Berlin International Conference on Wireless Telegraphy, 1906. Appointed Inspector of Wireless Telegraphy, 1908., Post Office delegate at International Conference on Wireless Telegraphy, London, 1912. Technical Adviser to the Board

of Trade on Wireless matters at International Conference on Safety of Life at Sea, London, 1914. Address: The Old House, Foot's Cray, Kent.

Lyons, Colonel Henry George, D.Sc., F.R.S.—B. 1864. Educ. Wellington College. Director and Secretary Science Museum since 1920. Director-General of the Survey Department in Egypt, 1898-1909. Victoria Research Medal, R. Geog. Soc., 1911. Symons Gold Medal of Royal Meteorological Society, 1922. Member of the Meteorological Committee. Commandant Army Meteorological Services during the War; Acting Director Meteorological Office, 1918-19. Chairman of Sub-Committee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Chairman National Committee for Geodesy and Geophysics. Address: 3, Cambridge Square, W.2.

Makower, A. J.—B. 1876. Educ. University College School, Gower Street, and at the College itself, between 1884 and 1895. Studied at Trinity College, Cambridge, taking degree 1898. Proceeded to Technical School, Charlottenburg, Germany. Joined the British Thomson-Houston Company, Rugby. Received an appointment as Head of the Electrical Engineering Department. At one time Secretary of the Board of Studies in Electrical Engineering, and Chairman of the Board of Examiners in Electrical Engineering. Author of many papers on wireless subjects. Resigned his teaching post and became managing director of Mossay & Co., Ltd., designers and selling agents for commercial electric vehicles, 1918. Chairman of the Electric Vehicle Committee of the Society of Motor Manufacturers and Traders. Addresses: 12, Greencroft Gardens, N.W.6, National Liberal Club, and The Oxford and Cambridge Musical Club, and 7, Prince's Street, S.W.

Makower, Capt. W., M.A., D.Sc.—B. 1879. Educ. University College School and University College, London. Took degree in Chemistry at the University of London, 1900. On proceeding to Trinity College, Cambridge, 1902, commenced investigations at the Cavendish Laboratory on radio activity. Elected to a Research Fellowship in the University of Manchester. Subsequently Assistant Director of the Physical Laboratories. Continued these researches until 1917. Joined the R.N.V.R. as a lieutenant, 1917, and subsequently became captain in the R.A.F. During the war, at the Air Ministry Laboratory in the Imperial College of Science and Technology, working on thermionic valves and other matters connected with wireless telegraphy. Since the Armistice has been engaged on various problems connected with wireless telegraphy and navigation being investigated at the Air Ministry Laboratory. Most of his scientific publications have been in connection with radio-activity, of which, perhaps, the most important are on the subject of radio-active recoil, which he discovered with Dr. S. Russ in 1909, and he was awarded the degree of D.Sc. at London as a result of his early investigations in this subject.

Marchant, Edgar Walford, D.Sc.—B. 1876. Educ. University School, Hastings, and Central Technical College. Graduated B.Sc. at London University with honours in physics and mathematics, and subsequently took the degree of D.Sc. After serving an apprenticeship appointed Superintendent of Lord Blythwood's laboratory and workshops at Renfrew, N.B., 1897, where he carried out many experiments in

wireless telegraphy. Leaving Renfrew in 1900, served as chief assistant for one year at the Finsbury Technical College under the late Professor Silvanus P. Thompson. Lecturer in electro-technics at University College, Liverpool, 1901, and later Professor of Electrical Engineering. Closely associated with the late Mr. Duddell in the development of the oscillograph. Author of a number of articles on wireless and cognate subjects, including a short book on "Radio-telegraphy and Telephony." David Jardine Professor of Electrical Engineering in the University of Liverpool. Vice-President of the Institution of Electrical Engineers. Member of British National Committee of Radiotelegraphy. Vice-President of the Radio Society of Great Britain. Past President of the Liverpool Engineering Society, Past Chairman of the Manchester Section of the Institution of Electrical Engineers. Address: 2, Ivanhoe Road, Sefton Road, Liverpool. University Club, Liverpool; Royal Liverpool Club.

Marchant, W. H.—B. London, 1881. Commenced experimental work in connection with W.T., 1904. From 1906-11 he served with De Forest Syndicate, Poulsen Company, and Lepel and Anglo-German W/T Companies, being chiefly engaged in experimental work. Since 1911 he has devoted himself mainly to literary work and to teaching. At present in the service of the Eastern Telegraph Co., at their London training centre. Address: 4, Branch Hill Side, Hampstead, N.W.3.

Marconi, Alfonso. B. Bologna, 1865. Educ. Bedford Grammar School, England, and Technical Colleges in Florence and Leghorn. Assisted his brother in carrying out his first experiments in wireless telegraphy on one of his father's estates near Bologna. Joined the board of Marconi's Wireless Telegraph Company and the Marconi International Marine Communication Co., Ltd., July, 1909. Is also on the Board of the Spanish and General Corporation, Ltd., and the Relay Automatic Telephone Co., Ltd. Member of the Bath Club, Royal Thames Yacht Club, and also of the Royal Institution of Great Britain. Address: D2, Albany, Piccadilly, W.

Marconi, Senatore Guglielmo, G.C.V.O., LL.D., D.Sc.—B. Bologna, Italy, 1874. Irish on his mother's side. Educ. Leghorn and Bologna. First interested himself in the problem of wireless telegraphy, 1895. Visited England, 1896, and took out the first patent ever granted for a practical system of wireless telegraphy by the use of electric waves. Earliest experiments in England made at Westbourne Park. The Italian Government conferred upon him the honour of knighthood. He has been decorated by the King of Italy and the late Czar of Russia, is an honorary doctor of many universities, besides having received the freedom of the principal Italian cities. In 1909 (in conjunction with Professor Braun) he was awarded the Nobel Prize for Physics. In 1912 he was decorated with the Grand Cross of Alfonso XII and made Grand Officer of the Order of St. Maurice and Lazarus. Elected a senator in the Italian Parliament (1914). On July 24th, 1914, the King bestowed upon him the Honorary Knighthood of the Grand Cross of the Victorian Order. He also holds many scientific awards granted by various societies and institutions, including the Albert Medal of the Royal Society of Arts, of which he is Vice-President. April 12th, 1915, Awarded the Gold Medal of I.R.E. (America) College of the City of New York, June 20th, 1922, and John Fritz Gold Medal for the Invention of

Wireless Telegraphy, July 6th, 1922. Immediately on the declaration of war by Italy, he was given the rank of Lieutenant in the Italian Army. He has been employed on important military missions to England by the Italian Government, and on July 29th, 1916, was promoted Captain "for exceptional services." At the beginning of September, 1916, he was transferred from the Italian Engineer Service to be temporary Commander in the Navy. He visited the United States, 1917, as Member of the Official Mission sent by Italy to the U.S.A. Government. On June 26th, 1919, he was appointed by H.M. the King of Italy Plenipotentiary Delegate to the Peace Conference at Paris, and in this capacity he signed the Peace Treaties with Austria and Bulgaria. At the end of 1919, he was awarded the Italian Military Cross. He has been decorated with the Italian "Ordine Civile" of Savoy, and has been nominated by the King of Italy to be a member of the Supreme Council of the same Order on the proposal of Signor Giolitti. He is Chairman of the Board of Directors of the Marconi Company. Address: Marconi House, Strand, W.C.2.

Marriott, Robert Henry.—B. 1879. First experimented with wireless telegraphy in 1899, while student at the Ohio State University, U.S.A. Employed by the American Wireless Telephone and Telegraph Company, Philadelphia, 1901, for which company he erected stations at Breille, Galilee and Barnegat, N.J. Chief Engineer of the Pacific and Continental Wireless Telephone and Telegraph Company. Installed three stations in California, at Avalon; Santa Catalina Island, and San Pedro, 1902. Employed with the Carstarphen Electric Company at Denver, Colorado, 1903. Constructed stations for the American De Forest Wireless Telegraph Company, and its successor, the United Wireless Telegraph Company, in Colorado, Wyoming, and Texas, 1905. In charge of this Company's construction and maintenance, 1910. Entered Marconi Wireless Telegraph Company of America, 1911. Entered the U.S. Government service as Radio Inspector, 1912. Now Radio Engineer, Puget Sound Navy Yard, Washington. First President of the Institute of Radio Engineers.

Marva, General, J.—B. 1846. Practically the pioneer of Wireless Telegraphy in the Spanish Army. Founder of first Spanish Aerodrome at Cuatro Vientos. Author of many scientific works (*Mecánica apli ada a las c ns ru tiones*, *Tracción en fè reas*, etc.). Member, Royal Academy of Sciences.

McLachlan, Norman W., D.Sc. (Eng.).—B. Longtown, Cumberland, 1888. Educ. Carlisle Grammar School and the George Watson and the Heriot-Watt Colleges, Edinburgh, and Liverpool University. Served apprenticeship with Messrs. Bruce, Peebles & Co. In 1909 was appointed Lecturer in Engineering and Mathematics at Newcastle-on-Tyne. In 1913 Supervisor of Classes in Engineering Subjects in the Liverpool Technical Institutes. During the war carried out much research work for Government in aeronautics and anti-submarine devices organising a laboratory at Air Ministry for research on liquid and gaseous oxygen apparatus for aircraft use. After the Armistice engaged in magneto research at the National Physical Laboratory, Teddington. At present Independent Research Engineer in service of Marconi Company. Associate of the Heriot-Watt College and a D.Sc.(Engineering) of the University of London. M.I.E.E., Fellow P.S.

London. Fellow Inst. P. Author of many papers on various subjects in the Journal of the Institution of Electrical Engineers and other scientific journals. Holds patents for Wireless Telegraphy and allied subjects. Addresses: Marconi Works, Chelmsford and Engineers' Club.

McMichael, H. Leslie.—B. Birkenhead, 1884. Educ. Ackworth and Mason College, Birmingham. Apprenticed to Messrs. Duckett and Brown, Electrical Engineers, Birmingham, afterwards taking control of one branch of the business. Among the first to hold a receiving and transmitting licence in London and had a station in London prior to 1914. His experimental work lay chiefly in the direction of sensitive synthetic crystals, and with Mr. R. H. Klein he was responsible for the synthetic crystal "Radiocite." One of the founders of the Radio Society of Gt. Britain, and has taken an important part in its management since its origin; first in the office of Vice-Chairman, and since 1919 as Honorary Secretary of the Society. During the war served in the Wireless Instructional Section of the R.A.F., and now actively engaged in the wireless industry as Managing Director of L. McMichael, Ltd. Also a Director of B. Hesketh, Ltd., and other commercial concerns. Honorary Secretary Radio Society of Gt. Britain. Club: Constitutional. Address: 32, Quex Road, West Hampstead, N.W.6.

McPherson, Andrew.—B. 1880. Educ. at Allen Glen's School and the Royal Technical College, Glasgow. Engineering Training with the Electric Construction Co., Ltd., of Wolverhampton. Was appointed Assistant Engineer to the Public Works Department of the Nigerian Government, Chief Engineer of the Nova Empreza Luz Electrica, Maceio, Brazil, and later Engineer and Manager of the Madeira Electric Lighting and Power (1909) Co., Ltd., Funchal, Madeira. Joined the G.P.O. in connection with the original scheme for the Imperial Wireless Chain, and in 1915 was transferred to the Admiralty in connection with Wireless Telegraphy Engineering. From 1915 to 1917 was engaged in inspecting and reporting on Wireless Telegraphy Stations abroad. At present Head of the Wireless Shore Station Division of H.M. Signal School, Portsmouth. Address: 22, Cousin's Grove, Southsea, Hants.

Meissner Alexander, Dr. Tech. Dr. Eng.—B. Vienna, 1883. Studied at Technical High School and University, Vienna; became assistant at the Technical High School. Joined the Laboratory of the Telefunken Company, Berlin, prominent part there in the development of the technique of wireless in Germany, having been responsible for the introduction of the Flat-coil, the most favourable diameter for high frequency coils, musical quenched sparks, timed sparks, Telefunken compass, interference-reception, direct current cathode valve relay for Morse reception, etc. Address: Berlin W. Mathesle webstratt.

Mesny, René.—B. 1874. Educ. The Naval School, Brest. Naval Officer 1894, Professor of Naval Construction in the Naval School, 1901. During the war attached to the wireless service. Now attached to the Laboratoire de la Radiotélégraphie Militaire. Officer of the Legion of Honour, Member of the Société d' Physique and the Société des Electriciens. Secretary of the Société des Amis de la T.S.F. Address: Direction du Matériel de la Radio-télégraphie Militaire, 51 bis, Bd. Latour-Maubourg, Paris.

Mezeviris, Greg, Commander, H.R.N.—Born 1891. Educ. Royal Naval College, 1906-1910. Officer of the R.N., 1910. Served during the Balkan War (1912) on different ships, 1913-1915 in submarine service. Specialised as torpedo officer and served on the battleship "Averoff." Appointed to the Naval War Staff (1917). During the European war served on destroyers. In 1919 appointed to the Torpedo School as professor of electricity. Promoted commander in 1920. Sent by the Greek Government to Paris, followed a special course on wireless telegraphy at the "Ecole Supérieure d'Electricité," during the period 1920-1921, and obtained the diploma of radio-engineer. On his return to Greece was appointed chief of the technical department and first assistant to the Head of the Radiotelegraphic service of the Navy. Chief of the main Athens station and Professor at the Radiotelegraphic School. Since 1922 he has also been professor of Electricity at the Military Academy and the Royal Naval College. Author of six books on electricity and wireless and contributor of many articles to the "Naval Review."

Mullard, S. R., M.B.E.—B. 1883. Educ. Private and London Electrical Engineering Colleges. Apprenticed to London firm of electrical engineers; 1908, Assistant Works Manager Société Anonyme de Usines Pintsch. 1910 to 1915, Head of Research Laboratory, Edison & Swan, Ltd. (here developed the "Pointolite" arc lamp). 1916 to 1918, Lieut. R.N.V.R., attached to R.N.A.S. for wireless duties. 1918 to 1919, Capt. R.A.F., Head of Wireless Section Research Laboratory, Imperial College of Science, on behalf of Air Ministry. 1919 to 1920, Research in wireless valve manufacture and development. Contractor to H.M. Government for wireless valves. September, 1920, formed the Mullard Radio Valve Co., Ltd. Appointed Managing Director of the Company. Club: Royal Air Force. Address: 45, Nightingale Lane, S.W.12.

Nally, Edward Julian.—B. Philadelphia, 1859. Pioneer in different modes of communication in America, having had charge of the first Edison telephone in St. Louis, Missouri. Started business career as a messenger boy for the Western Union Telegraph Company, in St. Louis, and worked his way up through various steps to the position of Vice-President and General Manager of the Postal Telegraph-Cable Company, which he resigned in 1913 to accept the office of Vice-President and General Manager of the Marconi Wireless Telegraph Company of America. Under his management the first commercial wireless circuit was opened to the public between the United States and Japan, in 1914. During the period of the war commercial wireless service by private companies was interrupted, but immediately upon the return of the stations by the United States Government on March 1st, 1920, he established the first direct commercial wireless circuit between the United States and Great Britain, which was soon followed by similar services to Norway, Germany and France. Upon the formation of the Radio Corporation of America, in 1919, he was elected President and Director, also President and Director of the Pan-American Wireless Telegraph and Telephone Company and the Wireless Press, Inc., from which position he resigned in 1922 to become Managing Director of International Relations (R.C.A.). 1923 elected Managing Director Commercial Radio International Committee. Clubs: Century, Static, Bookfellows, China, Lawyers', Pennsylvania Society, American Irish Historical Society, American Geographical

Society, National Geographic Society, Ends of the Earth, etc. Residence: E-l-ar-en Farm, New Hamburg, N.Y. Business address: Woolworth Building, New York; 30, Rue de la Paix, Paris.

Navarro y Ortiz, D. Benito, Major, Spanish Royal Engineers.—Chief of the Wireless Service of the Army permanent land stations (1918). In 1913 took charge of the Spanish Army Station of Carabanchel EGC (Madrid), until 1918. Decorated by the Spanish Government with the White Military Cross (December, 1919) for his knowledge and merit in wireless matters. Has contributed largely to the development of wireless telegraphy in Spain.

Nicholson, Commander Richard Lindsay, D.S.O., late Royal Navy.—Born in London, 1882. Educ. privately. Entered Royal Navy, 1898. Served as wireless officer on the staff of H.M.S. "Vernon," afterwards in the 3rd and 4th Divisions of the Home Fleet. Qualified for the Naval War Staff, and served on the Admiralty Committee (1914) which revised the Naval wireless telegraph and signal books, etc. In July, 1914, was appointed wireless telegraph officer on Lord Jellicoe's staff, and in September of that year was appointed Fleet wireless telegraph officer of the Grand Fleet, vacating this appointment in 1917 on being appointed to the Admiralty. Present at the battle of Jutland, promoted to Commander R.N., and appointed D.S.O., the wireless telegraph work of the Fleet being specially commended by Lord Jellicoe in his dispatches. Appointed Director of Signal Division of the Naval Staff at the Admiralty in 1917, with the rank of Acting Captain, R.N., and retained this appointment until November, 1919. Retired from the R.N. July, 1920. January, 1921, appointed Director of Wireless Telegraphy under the Government, India. During service as Director of Signals at the Admiralty proposed and carried to fruition the formation of the "Wireless Board" and "Imperial Communications Committee." Officer of the Legion of Honour, Commendatore of the Crown of Italy. Address: Director of Wireless, India.

Noble, Sir William.—B. 1861. Educ. Public Schools and Gordon's College, Aberdeen. Commenced his career in Aberdeen Telegraph Office as a telegraphist. In 1893, Engineer for the north-east area of Scotland. In 1897 promoted to Headquarters, London, as First-class Engineer. Subsequently successively Technical Officer, Assistant Superintending Engineer, London, Staff Engineer at Headquarters, Superintending Engineer, London, and in 1912 Assistant-Engineer-in-Chief, succeeding to the premier position in June, 1919. Retired January, 1922. Now Director of General Electric Co., and of British Broadfisting Co. In 1919 the King of the Belgians made him a "Chevalier de l'Ordre de la Couronne." Knighted June, 1920. Contributed articles to "Encyclopædia Britannica" on Telegraphy and Telephony, and paper to I.E.E., M.I.E.E., Inst. P.O.E.E. Addresses: Engineers' Club, Royal Automobile Club, and National Liberal Club, The Chase, Blackdown, Leamington Spa, and Magnet House, Kingsway, W.C.2.

Norman, Major the Rt. Hon. Sir Henry, B.A., 1st Bt. cr. 1915, Kt. cr. 1906. M.P. Blackburn since 1910, J.P. B. Leicester, 1858. Educ. privately in France; Harvard University (B.A.); Leipzig University; Officer of Legion of Honour; Mons Star, 1914. Assistant Postmaster-General, 1910; Chairman War Office

Committee on W/T (1912); Member of Committee on National Telegraphic Research and P.O. Telegraph Organisation Committee; Member of British Association Committee of Radiotelegraphic Investigation and of International Committee of Radiotelegraphic Research; Chairman of Imperial Wireless Telegraphy Committee (reported May, 1920); Vice-President of Radio Society of Great Britain; Fellow of Physical Society; Fellow of American Institute of Radio Engineers; Liaison Officer with French Government for Military Inventions; Vice-Chairman Imperial Communications Committee from March, 1919, to November, 1922, and Chairman of Wireless Sub-Committee. Member Broadcasting Committee, 1923. Addresses: The Corner House, Cowley Street, S.W.1; Ramster, Chiddingfold, Surrey. Clubs: Reform, Royal Automobile, Ranelagh.

Pannill, Charles Jackson.—B. Petersburg, Va., 1879. Entered U.S. Navy 1898, Chief Telegraphist of United States Coast Signal Service. Entered service of Professor Reginald A. Fessenden, 1902. Conducted experiments in radio communication across Hampton Roads. Installed communication by radio between New York and Philadelphia, 1903. Installed first radio outfit on United States battleship. Conducted experiments between stations of General Electric Company at Lynn and Schenectady; also between Brant Rock, Mass., and Machrihanish Bay, Scotland. Entered service of United Wireless Telegraph Company as Division Superintendent, 1909. Erected shore radio stations on Great Lakes, later in charge of division south of New York. Entered service of Marconi Wireless Telegraph Company of America, 1912. Superintendent, Southern Division. Entered service of United States Government, 1914, as expert radio aid, Naval Radio Service. Promoted to Assistant to Director Naval Communications in charge of commercial radio service, 1917. Now Vice-President and General Manager Independent Wireless Telegraph Company, New York. President Cutting and Washington Radio Corporation. Director Radio Engineering Co. Fellow Institute of Radio Engineers. Member Washington Society of Engineers. Member of the Geographical Society.

Parker, J. N.—B. 1881, in Calcutta. Educ. Clifton College and the Royal Indian Engineering College, Coopers Hill. Joined Indian Government Telegraph Department. Appointed to Electrical Engineer's Office, Calcutta, 1904. Accompanied Mr. M. G. Simpson, then Electrical Engineer-in-Chief, to Burma, February, 1904, to assist in establishing wireless communication with the Andamans. Continued his connection with the Electrical Engineer's Office and the technical side of telegraph work, which included the erection of the 30-kw. Marconi stations belonging to the Department. Superintendent Indian Wireless Telegraph Stations, 1914-19. Represented the Indian Post and Telegraph Department in England at the India Stores Depot, 1920-22. A.M.I.E.E., Member of the East Indian United Services Club, 16, St. James Square, Bengal Club, Calcutta, Royal Bombay Yacht Club. Address: Messrs. Grindley & Co., 54, Parliament Street, Whitehall.

Pedersen, P. O.—B. at Sig, near Varde, Jutland, 1874. Entered Royal Technical College, Copenhagen (1892). Cand. Polytechnic (1897). Chief Engineer of Telegrafonen, Ltd. (Poulsen Patent), 1899-1902. Lecturer at the Royal Technical College, Copenhagen, and

Professor from 1912. On board of Dansk Telegrafonfabrik (Danish Telephone Co., Ltd.), 1903-12, as well as on Elektroteknisk Forening (Electrotechnic Association) from 1910; Chairman from 1916. President Danish Institute of Civil Engineers—1920-23. Director of Det Kontinentale Syndikat for Poulsen Radiotelegrafi (Continental Syndicate for Poulsen Radiotelegraphy) from 1911-19. Member of International Electrotechnical Commission. Fellow Inst. Radio Engineers since 1915. Fellow Am. Inst. Electrical Engineers since 1920, and a Fellow Royal Danish Academy of Science since 1917. Member of the Telephone Commission (1917), of the Control Committee of licensed Telephone Companies, of the Commission on the training of radio operators, and of the Radio Commission of 1920. Technical Adviser in Radio to the Department of Public Works 1922. Principal of and Professor in the Royal Technical College, Copenhagen. His contributions to electrotechnical literature have been both important and numerous. Address: Amalievej 1, Copenhagen, V. Denmark.

Peri, Francois Michel. B. 1871. Educ. Lycée National, Toulon. Commandant of Colonial Infantry. Officer of the Legion of Honour. Planned the wireless chain in Indo-China, comprising 15 stations and 2 D.F. installations. During the war he supervised the construction of the high-power station at Doua, which on and after September 21st, 1914, secured communication with Russia and, later, with America. Introduced the first C.W. apparatus for aircraft, employing vacuum tubes of his own invention. Specialist in vacuum tubes. Inventor of the intertwined type of grid and anode, the zig-zag calibrated grids of great rigidity (patent acquired by the Cie Generale de T.S.F.). Co-inventor of the French valve (Peri-Biquet Patent, acquired by the Marconi Company). Inventor of the resistance coupling for amplification (patent acquired by the Soc. Française Radioelectrique), of the electrostatic microphone condenser, and of various appliances for the protection of receiving apparatus from atmospheric disturbances. Constructed and inaugurated in March, 1923, the large station at Yunnanfon (China), equipped with high-frequency alternators. Address: Chef du Service Radiotélégraphique de l'Indo-China, Hanoi, Tonkin.

Petavel, Sir Joseph Ernest, K.B.E., D.Sc., F.R.S.—B. 1873. Educ. University College, London. Scientific Research at the Royal Institution and at the Davy Faraday Laboratory, 1896-98. John Harling Fellow, Owens College, Manchester, 1900-03. Scientific Manager, Low Temperature Exhibit of the British Royal Commission for the St. Louis Exhibition, 1904. Professor of Engineering and Director of the Whitworth Engineering Laboratories, University of Manchester, 1908-19. At present Director National Physical Laboratory, Teddington. Publications: Papers in the Philosophical Transactions of the Royal Society, "The Philosophical Magazine," "Engineering," etc. Member of Aeronautical Research Committee and other Government Committees connected with Aviation. Member of Committee on Imperial Wireless Scheme. Clubs: Athenæum; Royal Automobile, Primrose Club, London. Address: National Physical Laboratory, Teddington, Middlesex.

Petit Gaston Emile.—B. 1877, in Paris. Educ. Ecole Polytechnique and Ecole Supérieure d'Electricité. Chief of the Wireless Telegraphy Service at the French Ministry of Postes et

Télégraphes, 1905. Member of the International Conference on Wireless Telegraphy, Berlin, 1906. Technical Director of the Compagnie Générale de Télégraphie et de Téléphonie, 1920. Consulting Engineer, Cie. Générale de T.S.F. and Société Française Radioélectrique. Address: 6, Rue Nansouty, Paris (xive.).

Pickard, Green'eaf Whittier.—B. Portland, Me., 1877. Educ. Westbrook Seminary, Harvard, and Mass. Institute of Technology. Began radio work 1899, at Blue Hill Observatory, Milton, Mass., under a grant from the Smithsonian Institution. Became associated with Harry Shoemaker, 1901. On the engineering staff of the American Telephone and Telegraph Company, 1902-06. Developed a practical system of radiotelephony, obtaining successful speech transmission without wires, 1902. From 1906 until the present date has been connected with the Wireless Specialty Apparatus Company as consulting engineer. Inventor of a method of reducing static interference, which was extensively used by the U.S. Navy for transatlantic reception during the war. Practices extensively as patent expert in wireless patent litigation, and is the author of many papers on radio communication. Fellow of the American Institute of Electrical Engineers. Member of the American Electrochemical Society. Member of the Society of Mechanical Engineers. Past President and Fellow of the Institute of Radio Engineers. Private address: Newton Centre, Mass. Office address: 76, Atherton Street, Jamaica Plain, Mass.

Pletts, John St. Vincent.—B. Ryde, I.O.W., 1880. Educ. locally and at Central Technical College. Joined Marconi's Wireless Telegraph Company, Ltd., 1899. Constructed wireless stations in Hawaii, Labrador, the Congo, Russia, and the Far East. Deputy Chief of Staff, 1906. Head of that Company's newly formed Patent Department, 1910. Expert in Cryptography at the War Office, 1914. Consulting Engineer, 1919. Member of various scientific societies, and author of a number of technical articles. Address: Marconi House, W.C.2, and Shalston House, Ewell Road, Surbiton.

Pocock, Hugh S.—Editor "The Year Book of Wireless Telegraphy and Telephony" prior to outbreak of war. Captain Royal Engineers, serving Egypt, Mesopotamia, Persia, on intelligence duties. Mentioned in dispatches for wireless services in Mesopotamia. Editor "The Wireless World and Radio Review." Member of the Institute of Radio Engineers, and Committee Member of the Radio Society of Great Britain. Address: 20, Brondesbury Villas, N.W.6.

Poulsen, Valuemar, Eng., D.Sc. D.Ph., Leipzig (1909).—B. Copenhagen, 1869. Studied at University of Copenhagen, 1889-93. Entered technical department Copenhagen Telephone Company, 1893, and for a number of years superintended electrical testing operations. Collaborated with Prof. P. O. Pedersen for many years. Member of the board of the Telegrafonen, Ltd. (Poulsen Patent), 1902-16. Joined board of Dansk Telegrafonfabrik, Ltd., 1909, and that of Poulsen Wireless Telephone and Telegraph Company, U.S.A. (1909-11). Fellow of Danish Society of Sciences (1914). Grand Prix at Paris in 1900 for telephone work. Invented in 1903 the arc method of generating continuous electrical waves of wireless frequencies. Address: Gentofte Maltegaardsvej 6, Copenhagen.

Prince, Major, Charles Edmond, O.B.E.—B. Capetown, 1874. Educ. Clifton College and Faraday House. Joined Marconi's Wireless Telegraph Company, Ltd., 1907, specialised in Research Work and particularly in Wireless Telephony. Demonstrated first Marconi Field Station in Italy and Switzerland, 1909. Instituted important improvements in Bellini-Tosi Direction Finding System. Granted commission in Westmoreland and Cumberland Yeomanry, 1911. Attached R.F.C., April, 1915. Developed at Brooklands in same year first aircraft wireless telephone. Gazetted experimental officer (First-Class), December, 1915. Mentioned in dispatches 1918, and in the same year appointed Major. Granted M.B.E. 1918, O.B.E. (Military Division), 1919. Research Dept. Marconi's Wireless Telegraph Company, Ltd. Addresses: Stubbings Manor, Burchetts Green, Berks.; 63, Drayton Gardens, London, S.W. Club: Royal Air Force Club.

Rego, Capt., T. R. Moraes.—B. Rio de Janeiro, 1882. Completed training at Naval Academy, 1900. Served for a few years on ships, studying electricity and torpedoes. Torpedo-Lieutenant in the Professional Torpedo School. Began studying radiotelegraphy when first wireless stations were installed in Brazilian Navy, 1904. Assistant in the Radio Department of the Navy on several occasions. Appointed (1914) Chief of the Radio Service, Brazilian Navy, which post he resigned to be appointed Commander of warship "Alagoas" in 1920, resigning this command in 1922, and being then appointed Sub-Chief Military Staff of President of the Republic of Brazil. Club: Naval Club. Address: Palácio Presidencial, Cattete, Rio de Janeiro, and Rua Ipanema 22, Copacabana, Rio de Janeiro.

Reith, John Charles Walsham, M.Sc., A.M.I.C.E., A.M.I.Mech.E.—B. 1889. in Scotland. Educ. the Glasgow Academy, Gresham's School, Norfolk, and the Royal Technical College, Glasgow. Engineering apprenticeship in Glasgow. 1912-14 Engineer with S. Pearson & Son, Ltd., London. Service in France, Oct., 1914—Nov., 1915, with Royal Engineers (Major). Wounded. In charge of American munitions contracts in America 1916-17; engaged on special construction work in England, latterly with the Admiralty, 1918-19; after Armistice in charge of liquidation of armament and engineering contracts, 1919-20. General Manager of William Beardmore & Co., Ltd., Coatbridge, 1920-22. General Manager of the British Broadcasting Company, Ltd., 1922. Clubs: Caledonian and Cavendish, London; Western, Glasgow.

Reoch, Alexander.—B. Sheffield, England, 1884. Educ. Sheffield Science School and Sheffield University College. Graduated in electrical engineering, 1902. Entered the service of the English Marconi Company in June, 1902, and undertook construction and operating work in England, Holland, Germany, and Egypt. Appointed engineer with the Canadian Marconi Company, 1905, and from 1909 to 1911 in complete charge of the business during which time that company's contract with the Canadian Government for the operation of the Great Lakes stations was negotiated, as well as the contract between the Canadian Company and the Newfoundland Government. Chief Engineer of the Canadian Marconi Company, 1917, and at the beginning of 1918 he relinquished this position to take an appointment on the engineering staff of the American Marconi Company. Appointed, 1920, Plant

Engineer, Radio Corporation of America. Appointed January 1st, 1921, Assistant Chief Engineer Radio Corporation of America. Fellow Institute Radio Engineers. Associate Member Engineering Institute of Canada. Member Franklin Institute of the State of Pennsylvania. Address: 66, Broad Street, New York.

Rivers-Moore, H.R., B.Sc., A.C.G.I., A.M.I.C.E., A.M.I.E.E.—B. 1884. Educ. at Wellington College and London University. Apprenticeship George Clark, Ltd., Engineers, Sunderland. Post Office Engineer-in-Chief's Dept., 1907. Delegate to 2nd International Telegraph Conference at Paris, 1910. Appointed to Wireless Section of the Post Office, December, 1910. In 1913 purchased and carried on the business of the Wilson Apparatus Co. In 1916 this business was taken over by the Indo-European Telegraph Co., Ltd., and associated successively with Messrs Creed & Co., Ltd., Croydon, and Automatic Telephone Co., Ltd., Liverpool. Appointed in 1918 Asst. Physicist at Admiralty Anti-Submarine Dept. Parkstone Quay, and subsequently given the rank of Hon. Capt. Marines. In 1919 organised the firm of "R. M. Radio, Ltd.," and is Chairman of this Company and of General Wireless, Ltd.

Robinson, James, M.Sc., Ph.D.—B. 1884. Educ. University of Durham and University of Göttingen. Lecturer in Physics, University of Durham, 1906-7. Lecturer in Mathematics, Armstrong College, 1909-10. Lecturer and Demonstrator in Physics, University of Sheffield, 1910-12. Lecturer in Physics, East London College, University of London, 1912-15. Examiner in Physics, University of London, 1912-15. Lieut. R.N.V.R. for Wireless Duties, 1915-17. Lieut., R.N.V.R., attached R.N.A.S. for Experimental Wireless Duties, 1917-18. Captain R.N.A.S. for similar duties, 1918-20. Chief Experimental Officer, Instrument Design Establishment, Biggin Hill, 1920-22. Head of Department for Wireless and Photography, Royal Aircraft Establishment, Farnborough, 1922. Responsible for various Patents. F.Inst.P. Fellow Physical Society of London. Member Radio Society of Great Britain. Address: R.A.F. Club, 128, Piccadilly, W.1, or Royal Aircraft Establishment, South Farnborough, Hants.

Rodrigues, Apolinio Gomes da Silva, Fla. Captain in the Portuguese Navy.—B. 1866. Entered Portuguese Navy in 1886. Became Professor of Electricity and Torpedoes at the Naval College in 1902, and Professor of Electricity of Naval Auxiliary College, 1905. Entrusted with embodiment of Naval Regulations concerning wireless in 1909. Elected Member of Advisory Committee on wireless in the Portuguese Navy in 1910.

Rutherford, Sir Ernest, Kt., F.R.S.—B. New Zealand, 1871. Educ. Nelson College, Canterbury College, New Zealand University, Cambridge University. Cavendish Professor of Experimental Physics, Cambridge, and Fellow of Trinity College, 1898-1907, Professor of Physics, McGill University, Montreal, 1907-1919, Professor of Physics, University of Manchester. Nobel Laureate, 1908. Has published many works dealing with the conduction of electricity through gases and radio activity. Address: Newnham Cottage, Cambridge.

Rydin, Sven Ludvig Herman.—B. Upsala, 1861. Graduated in Law, Upsala, 1885. Registrar attached to the Board of the State Railways, 1895-96, assistant to Director of the State Railways 1896-97, Member of the Board

of Telegraphs 1897-1902, Under-Secretary of State for Home Affairs 1902. Since 1905 Director-General of Telegraphs in Sweden. Grand Commander of the "Nordstjærna." Member of "Idun," Society in Stockholm for Science, Literature and Art, and of the Royal Swedish Yacht Club (Kungl. Svenska Segel Sällskapet, K.S.S.S.). Address: Kungl. Telegrafstyrelsen, Stockholm.

Salmond, Captain J. S. C., R.N.—B. 1882. Entered "Britannia," 1897, left 1898. Served in China in "Barfleur," landed in the Boxer operations, 1900. Mentioned in despatches. Qualified as torpedo lieutenant, 1905. Served in Wireless Telegraphy Experimental Department, "Vernon," 1908-11. Fleet Wireless Telegraphy Officer, Home Fleet (later Grand Fleet), 1912-15. Wireless Telegraphy Assistant to D.N.O. Admiralty, 1915-17. In command of "Odin," in Red Sea, 1917-19, mentioned in despatches for operations against Turkish forces in the Asir and Yemen. Served in Signal Division, Admiralty, on Wireless Telegraphy duties. Member of Radio Research Board. Commanding H.M.S. "Yarmouth," wireless "telegraphy experimental ship.

Saltzman, Charles McKinley, Colonel.—B. 1871, State of Iowa. Started business as railway telegraphist and graduated at West Point, 1896. As cavalry officer took part in the Spanish-American War, 1898. Signal officer during the Insurrection in the Philippine Islands. Transferred to the Signal Corps of the U.S. Army, 1901. Since identified with the electrical cable and radio work, U.S. Army. In charge of the radio work of the U.S. Army on the Panama Canal. Represented the United States at the International Radiotelegraphic Conference of London, 1912. Member of the Inter-Departmental Board which prepared regulations for the control of radio telegraphy in the U.S.A., 1912 to 1913. Executive Officer, Office Chief Signal Officer, War Department, Washington, 1917 to 1920. Graduate Army War College, 1921. On duty in Office, Assistant Secretary of War, Washington, 1922. Signal Officer, 2nd Corps Area, U.S. Army, Governors Island, N.Y., 1923.

Sankey, Captain M. P. H. Riall, C.B., C.B.E., R.E. (ret.)—B. Nenagh, Ireland, 1853. Educ. Switzerland, Royal Military Academy, Woolwich, School of Military Engineering, Chatham. Served in England, at Gibraltar, and as Instructor in Fortification at the Royal Military College, Kingston, Canada. Posted to the British Ordnance Survey, and had charge of the Trigonometrical Division, the Electrotyping Department and the Workshops. Retired from the service (1889) to join the Board of Messrs. Willans and Robinson, Ltd., and (1904) took up consulting work. Shortly afterwards joined the Boards of Marconi's Wireless Telegraph Company, Limited, and the Marconi International Marine Communication Company, Limited. Also a Director of several other companies. Served during war as Hon. Engineering Adviser to the Director of Fortifications and Works. Author of "The Energy Chart," "Practical Application to Reciprocating Steam Engines," Part IV of Rimington's "Construction" (anonymously). Translated from German Prof. Ritter's book on "Bridges and Roofs." Contributed numerous papers to I.C.E., I.M.E., I.E.E., Inst. Naval Architects, Royal Society of Arts, Royal Society, etc., etc. Member of the following institutions: Civil Engineers, Mechanical Engineers (President 1920 and 1921), American Mechanical Engineers,

Electrical Engineers, Royal Institution of Great Britain, Iron and Steel, Naval Architects, Junior Engineers, and Gas Engineers. Member of the Governing Board of the National Physical Laboratory and of the Wireless Telegraphy and Gaseous Explosives Committees of the British Association. Address: 57, Castle Bar Road, Ealing, W.5.

Sarnoff, Da id.—B. in Russia 1891. Entered the United States 1900, and later became an American citizen. Employed as a messenger by the Commercial Cable Company, 1906. Entered the employ of the Marconi Wireless Telegraph Co. of America as office boy, 1906. Wireless operator at Siasconset Station, Nantucket Island, 1908. Manager, Marconi Station, Sea Gate, New York, 1909. Radio Inspector for Marconi Company and Instructor, Marconi Institute, 1912. Became Commercial Manager of the Marconi Company of America, 1917, and when that Company was absorbed by the Radio Corporation of America, was taken over as Commercial Manager of that concern, and became General Manager, 1921. Vice-President and General Manager, Radio Corporation, 1922. Member of the American Institute of Electrical Engineers; Fellow of the Institute of Radio Engineers; Member New York State Chamber of Commerce, and of the American Railway Association. Clubs: Railroad Club, Whitehall Club, Lotus Club. Address: 180, Pennsylvania Avenue, Chester Hill Park, Mount Vernon, New York.

Schwill, Fr.—B. Strasburg (in Alsace), 1875. Started career as member of the German Post and Telegraph Service. Took part in the International Radiotelegraphic Conference at Berlin in 1906. Appointed by the Swiss Federal Government to the International Bureau of the Telegraphic Union to organise and supervise the new Radiotelegraphic section established by the Berlin Conference. Present position, Sub-Director of the International Bureau of the Telegraphic Union at Berne. Address: Bureau International de L'Union Télégraphique, Berne.

Scott-Taggart, John.—Educ. Bolton Grammar School, technical establishments and King's College, London. For three years Departmental Manager and Research Engineer, Radio Communication Company, Ltd. Now Consultant to this Company, and acts in an advisory capacity to other concerns. Managing Director of Radio Press, Ltd., and Editor of *Modern Wireless and Wireless Weekly*. Sometime in charge of valve design and construction at Edison Lamp Works. Served 1914 to 1919: sometime Instructor of Wireless to 1st Army, but chiefly Wireless Officer to various units. Mentioned in despatches. Awarded Military Cross. Author of various papers before British Association and other societies, and numerous articles: also the volumes: "Thermionic Tubes in Radio Telegraphy and Telephony," "Elementary Text-book in Wireless Vacuum Tubes," "Wireless Valves Simply Explained," "Practical Wireless Valve Circuits," etc., etc. Fellow of the Institute of Physics and holds membership in the Physical Society and the British, American and French Institutions of Electrical Engineers. Address: 6, Beattyville, Gardens, Ilford.

Shaughnessy, Edward, H., O.B.E.—B. 1871. Engineer-in-charge wireless section, Engineering Department, British Post Office. Entered Post Office Engineering Department, 1896, served in experimental, testing, telegraph and cable sections, specialising on underground and

submarine cables. Member of the Radio Research Board. Post Office representative on Committee of Wireless Section, Institution of Electrical Engineers. Vice-President, Radio Society of Great Britain, Examiner in Telegraphy for the City and Guilds of London Institute. Member of some committees and panels of the British Engineering Standards Association. Address: Engineering Department, General Post Office, London.

Simpson, Lt.-Col. Adrian C.M.G. (late) R.E.—B. Edinburgh, 1880. Educ. Clifton and Sandhurst. Commissioned in His Majesty's Forces, 1900. Served in India, being transferred to the Regular Indian Army. Retired 1907. Becoming interested in wireless telegraphy, and started work with the English De Forest Wireless Telegraph Syndicate. His connection with Marconi's Wireless Telegraph Company commenced with his joining the Field Station Department. On the formation of the Russian Company of Wireless Telegraphs and Telephones, 1908, appointed managing director of that company. During the war served in Russia; and at the War Office. Late Director of Wireless Telegraphy under the Government of India. Deputy Managing Director of Marconi's Wireless Telegraph Co., Chevalier of Order of St. Anne, 3rd Degree, and of Order of St. Stanislaus. Addresses: Marconi House, Strand, W.C.2, The Naval and Military Club, and Ranelagh.

Sinclair, Duncan.—B. in London, 1896. Educ. Aske's Hatcham and King's College, University of London, and abroad. Entered Royal Flying Corps 1915 as wireless officer, and served in France 1916-18, and in Russia, 1919. Instructor at R.A.F. Electrical and Wireless School, 1918. Mentioned in despatches and awarded Order of St. Stanislaus. Appointed to Controllerate of Communications, Air Ministry, 1920, and to date has been actively engaged upon air route signals organisation, and commercial aeroplane and airship wireless. Author of papers on "Signalling on our Airways," "Airship Wireless in 1921," "The Applications of Wireless to Commercial Flying," "The Wireless Stations of the British Air Routes," etc. Member of American Institute of Radio Engineers, and Radio Society of Great Britain. Address, Air Ministry.

Sins, Ernest.—B. 1859, at Besançon. Joined the Ecole Polytechnique, later enrolling in the Corps of Telegraphic Engineers. Participated in the organisation of the telegraphic and telephonic systems in Tunisia. Received an appointment in the Central Office of Posts and Telegraphs, Paris, 1892, where he ultimately rose to the position of Telegraph Engineer-in-Chief. Chief of the Correspondence Department of International Telegraphy, 1899. Represented his country at the International Conferences on Radiotelegraphy held at Berlin, 1903. Sub-Director of the French Telegraphic Department, 1911, but resigned from the public service in the same year to take part privately in the development of wireless industry. One of the founders and directors of the Compagnie Générale Radiotélégraphique, and was afterwards managing director to the Compagnie Universelle de Télégraphie et de Téléphonie sans Fil. Since the beginning of 1918 general manager of the Compagnie Générale de Télégraphie sans Fil, and since 1921 administrator of the said company.

Slee, Commander J. A., C.B.E., R.N. (Ret.)—B. 1878, Wimbledon. Educ. on training ship "Britannia." Passed for his lieutenant's commission, and after service on the "Decoy,"

"Ernest," "Anson," and "Severn," qualified as Torpedo Lieutenant, and spent a year on the staff of the "Defiance" at Devonport, where he gained his first wireless experience, 1901. Whilst attached to H.M.S. "Queen," 1906, eyesight trouble developed and he was obliged to transfer to shore service. For two years after quitting the sea he served as one of the Wireless Telegraph Experimental Officers on the "Vernon" at Portsmouth, and from 1908 until 1919 was in charge of all shore wireless and war signal stations in Great Britain. Promoted Acting Commander, 1913. Acting Captain, 1918. On the formation of the Wireless Board was appointed its chief. Awarded C.B.E., 1919. Retired from the Navy December, 1919, with the rank of Commander. Joined the Marconi International Marine Communication Co. as Technical Superintendent and Adviser, January 1st, 1920. Appointed Technical Manager, M.I.M.C. Co., Ltd., June, 1921. Address: 7, Elvaston Place, London.

Smith, Tom Vincent, Major, M.C.—B. 1872, in London. Joined the Amalgamated Radio Telegraph Company in 1906, Director of the British Radio Telegraph Company. Consulting engineer until outbreak of war. Served on the Civil Aerial Transport Committee, and the Wireless Committee of the Institution of Electrical Engineers. President of the National Association of Supervising Electricians. Papers before the Royal Artillery Institution at Woolwich on "The Co-operation of Aeroplanes with Artillery," and before the British Association on "Aircraft Wireless during War." During the war was in charge of R.F.C. on the Western Front, and later Officer-in-Charge of Wireless at the Air Ministry for all theatres of war. Decorations: Military Cross, Knight of the Military Order of Savoy, 1914-15 Star. Twice mentioned in despatches. Address: Royal Thames Yacht Club, 80, Piccadilly, W.I.

Smith-Rose, Reginald Leslie, Ph.D., M.Sc.—B. 1894. Educ. Imperial College of Science and Technology. Practical experience with Messrs. Siemens Bros., Woolwich, from 1915-19, engaged on experimental work in connection with military, manual and automatic telephones; and latterly with thermionic valve amplifiers for telephone lines and wireless receiving sets. Now Assistant-in-Charge of the Wireless Division of the National Physical Laboratory, engaged on general Radio Research. Member of Sub-Committee "C" on Directional Wireless, of the Radio Research Board of the Department of Scientific and Industrial Research. Physicist-in-Charge of Directional Wireless Research under Sub-Committee "C" of the Radio Research Board. Fellow of Physical Society of London. Member of Radio Society of Great Britain. Address: National Physical Laboratory, Teddington.

Snell, Sir John Francis Cleverton, Kt. (Cr. 1914.) B. Saltash, Cornwall, 1869. Educ. Plymouth Grammar School, and King's College, London, 1883. With Messrs. Woodhouse & Rawson, and with Messrs. Crompton & Co., at the Kensington Court and Notting Hill Power Stations, and at Stockholm (Sweden), 1892. Resident Engineer at King's Road Station, St. Pancras, 1896, Borough Electrical and Tramways Engineer, Sunderland, 1906, in private practice as a Consulting Engineer, 1910, became partner of Messrs. Preece, Cardew, Snell and Rider, Consulting Engineers, 1919. Relinquished partnership and accepted position of Electrical Adviser to the Board of Trade and Chief Electricity Commissioner-designate, 1920,

appointed Chairman of the Electricity Commission. Member of the Nitrogen Products Committee (Ministry of Munitions), and Chairman of the Power Sub-Committee. Member of the Electrical Trades Committee (Board of Trade). Member of the Electrical Power Supply Committee (Board of Trade). Member of the Advisory Council for Scientific and Industrial Research. Member of the Imperial Wireless Telegraphy Committee. Member of the Electrification of Railways Advisory Committee. Past Pres. I.E.E. Member of Council I.C.E. Fellow I.E.E. (Amer.). Contributed: "Distribution of Electrical Energy," 1906 (Spon); "Power House Design," Second Edition, 1921 (Longmans); and many papers read before several Engineering Institutions. Addresses: "Southernway," by St. Martha's, Guildford, Electricity Commission, Gwydyr House, Whitehall, S.W., The Athenæum, Junior Carlton, St. Stephens and Royal Fowey Yacht Clubs.

Solari, Marquis Luigi.—B. in Turin. Was appointed officer of the Italian Royal Navy in 1890. Obtained the diploma of Electrical Engineer at the University of Turin in 1898. In 1900 placed in charge of the Laboratory of Wireless Telegraphy at the Royal Dockyard of Spezia. In 1902 took charge of the wireless telegraph station on the Italian warship "Carlo Alberto" during the historic experiments on that vessel conducted by Senatore Marconi. In 1903 delegate of the Italian Government to the Berlin Wireless Conference. In 1904-05 supervised the Wireless Telegraph Department of the Italian Ministry of Posts and Telegraphs. Official delegate of the Italian Government at the International Congress of Electricity held at St. Louis, U.S.A., in 1904. Joint inventor with Professor Lori, of the Padua University, of a magnetic relay. Has published several papers on wireless telegraphy in various periodicals and reviews. Since 1906 has devoted himself to the development of the Marconi system in several countries. Address: Via Maria Adelaide, 8, Rome (Italy).

Squier, Major-General Sir George Owen K.C.M.G., Ph.D.—Educ. Johns Hopkins University, Baltimore. Grad. Doctor of Physics 1893. Research student under the late Professor Rowland and in the laboratory of the late Sir William Preece at the British General Post Office. Discovered the use of living trees as a means of receiving wireless messages 1904 and published a paper entitled "The Absorption of Electro-Magnetic Waves by Living Vegetable Organisms." Author of numerous papers on the subject of wireless telegraphy and has devoted special attention to the use of wireless telegraphy in military operations. In 1896 the City of Philadelphia awarded him the John Scott Legacy Medal and premium for the polarising photo-chronograph. Awarded the Elliott Cresson Gold Medal for his researches in multiplex telephony, 1912. Member of, National Academy of Sciences, 1919. Awarded the Franklin Medal, 1919. Awarded the Distinguished Service Medal, United States Army, 1919. In 1919 decorated with the insignia of the Order of Knight Commander of St. Michael and St. George. In 1922 awarded the Italian decoration, Commander of Order of the Crown. In 1922 awarded Cross of a Commander of the French Legion of Honour. In 1923 appointed Honorary Knight Commander of the Most Distinguished Order of St. Michael and St. George. Chief Signal Officer U.S. Army. Formerly Military Attaché

to the American Embassy in London. Representative at the Conference of Interallied Radio Technical Committee, at Paris, 1921. Appointed an ex-officio member representing War Department of the United States National Committee, International Electrotechnical Commission. Address: War Department, Washington, D.C., U.S.A.

Swinburne, James, F.R.S.—Educ. Clifton College, 1870-74; apprenticed engineering works, 1874-9. Employed by Messrs. J. W. Swan & Co. (1881) to organise their lamp factory in Paris. Consulting Engineer since 1894. Author many papers before Scientific and Technical Societies, and in Technical Press. Member of the Technical Committees considering the Imperial Wireless Scheme, 1912 and 1919-20. Member of various scientific societies. President of the Institution of Electrical Engineers, 1902-3. Addresses: 82, Victoria Street, S.W.1; Woodhurst, Oxted, Surrey.

Swinton, Alan A. Campbell, F.R.S., —B. Scotland, 1863. Opened career in 1882 at the Armstrong Works, Elswick. Consulting electrical engineer in London since 1887, having been responsible for the carrying out of many large electrical installations. Chairman of Crompton & Co., Ltd., and director of several electricity supply and engineering manufacturing companies. Associated with the development of the Parsons turbine and other important inventions. A vice-President of the Royal Society of Arts; a vice-President of the Institution of Electrical Engineers; Chairman of the British Scientific Instruments Research Association; a Member of the Executive Committee of the Board of the National Physical Laboratory; Past President of the Röntgen Society; a Manager of the R. Institution of Great Britain (1912-15). Member of Sub-committee "B" on Atmospheric of Radio Research Board of the Department of Scientific and Industrial Research. Past President of the Radio Society of Great Britain. Has devoted considerable attention to scientific research, including wireless telegraphy. M.Inst.C.E., M.I.E.E., M.I.Mech.E. Clubs: Athenæum, Carlton, Junior Carlton, etc. Address: 66, Victoria Street, Westminster, S.W.1.

Tafur, Don José, Col., Spanish Royal Engineers.—B. 1861. Director of the Centro Electrotécnico until June, 1923. Has had the full control of the Wireless Services in the Spanish Army until present time. Decorated by the Spanish Government with the "Gran Cruz de Isabel la Católica" (a very high distinction) for his merits and his contribution to the development of all the technical services regarding communications in the Army. One of the chief contributors of military as well as civil wireless in Spain.

Todd, David Wooster, Captain U.S. Navy.—B. Round Valley, California, 1874. Educ. private and public schools in Mich., Nev., and San Francisco. Appointed to Naval Academy, 1891, graduated 1895. Served at sea on various vessels of the United States Navy, and in command of the "Pittsburgh" flagship in European waters; has served ashore as instructor in ordnance, Naval Academy; in charge of Radio Division of Bureau of Steam Engineering, Navy Department, and as Assistant Superintendent of the Radio Service. Attended International Radiotelegraphic Conference, London, 1912, as a delegate. Director Naval Communications, 1916. Attended Inter-Allied Radio Conference in Paris upon

United States entry into European War, and subsequently organised the American end of the Inter-Allied Transatlantic Radio System. Address: Naval War College, Newport, R.I.

Travailleur, Maurice.—B. Brussels, 1871. Graduated as engineer at Brussels University, 1893. Appointed Electrical Engineer to the late King of the Belgians, 1897. One of the founders of the Marconi International Marine Communication Co., Ltd., and the Société Anonyme Internationale de Télégraphie sans Fil. Managing Director of the Société Anonyme Internationale de Télégraphie sans Fil, and Chairman of the Agence Télégraphique Belge, both in Brussels.

Tsiang Tseng-yi.—B. Haining District of the Chekiang Province. Appointed Junior Clerk of the Board of Revenues, 1904. Soon afterwards transferred in the same rank to the Board of Communications (then known as Yuchuanpu) by its special recommendation for dealing with telegraph matters. Mr. Tsiang proposed that all the commercially and provincially owned telegraph lines be nationalised and placed under the direct control of the Yuchuanpu. This proposal was put into operation. In 1911, as Commissioner of Telegraphs of the Yuchuanpu, he caused two powerful radio stations to be established, one in Peking and the other at Nankin. Served over ten years in the telegraph service, holding the following important positions: 1910-11, Commissioner of Telegraphs of the Yuchuanpu; 1913-16, Chief of the Financial Department of Telegraphs, Posts and Navigation. Acted as Chief of the Telegraph Department and Director-General of Telegraphs of the Ministry of Communications, and Chairman of the Chinese Society of Electrical Science.

Turner, Samuel.—Educ. Barrow-in-Furness, Secondary School and Tech. College. Two years' works training at Messrs. Vickers Ltd., Barrow. Afterwards appointed to post in Research Section, Engineer-in-Chief's Office, G.P.O. London. Granted Commission in R.F.C., 1915, as Wireless Officer at Brooklands, becoming Lecturer and Instructor to R.F.C. W/T officers at Brooklands. Carried out research work on wireless telephony at Biggin Hill and Woolwich, 1917-18. Transferred to Air Ministry to develop own inventions, in Technical Section, for Service use. Resumed civilian research work, 1919. A.M.I.E.E., A.F.Aer.S., Member I.R.E. Address: The Gothic, Littlewick, Berks.

Turner, Laurence Beddome, M.A., M.I.E.E.—B. 1886. Educ. Bedford Grammar School and King's College, Cambridge (1904). First-class honours in Mechanical Sciences Tripos in 1907. Spent 1907-8 in research work at the C.U. Engineering Laboratory. After a year in the workshops and drawing office of Messrs. Siemens Bros. at Woolwich and Siemens u. Halske A.G. at Berlin, entered in 1910 the Engineer-in-Chief's office of the G.P.O. Engaged there in W/T experimental work, and in the design and installation of new ship-and-shore stations. Attached to the Army Signals Experimental Establishment at Woolwich 1916, where he designed wireless field apparatus, including the Infantry "Loop Set." Fellow and Lecturer of King's College, Cambridge, 1919. Member of the Imperial Wireless Telegraphy Committee, 1919; and of the Wireless Telegraphy Commission, 1920. Author of "Outline of Wireless," 1921, and various papers. Address: King's College, Cambridge.

Vallauri, Giancarlo.—B. Rome, 1882. Entered the Royal Naval Academy. Appointed officer of the Royal Italian Navy, 1903. After a few years at sea quitted the active naval service and joined the Polytechnic School in Naples, obtaining the diploma of engineer and the electro-technic diploma, 1907. Since conducted electrica tuition in the Polytechnic Schools of Padua, Karlsruhe and Naples. Connected with many industrial electric establishments. Inaugurated at the Polytechnic School in Naples a course in Wireless Telegraphy, 1912, and supervised that subject till the end of 1916. Became Director of the Institute of Electricity and Wireless Telegraphy of the Royal Navy, 1918. Is now also Professor of Electrotechnics at the University of Pisa and engaged in supervising the new station of Coltanocentre. His attention has mainly been turned to the study of ferromagnetic phenomena; to which he has made important contributions. Has published a series of papers on Ionic Valves, and on radiation measurements. Address: R. Accademia Navale, Leghorn, Italy.

Van der Bijl, Dr. H. J.—B. Pretoria, 1887. Educ. Victoria College, South Africa and Universities of Halle and Leipsic, where he gained his doctorate. Visited the United States in 1913, and joined the Engineering Department of the American Telephone and Telegraph Co., and Western Electric Co. Scientific and Technical Adviser to the Government of the Union of South Africa, 1920-23. Appointed Chairman of Electricity Supply Commission of the Union of South Africa, 1923. M.I.R.E., M.I.E.E. (Amer.). Among his inventions is the modulation system used successfully by the American Telephone and Telegraph Company in 1915 for wireless telephone communication over a distance of 5,000 miles. Figured prominently in the development of the Thermionic Vacuum Tube. Author of "The Thermionic Vacuum Tube and its Applications," and numerous publications in scientific and technical journals. Address: P.O. Box 1091, Johannesburg, Union of South Africa.

Van der Pol, Balth, Jun., D.Sc.—B. 1889, at Utrecht. Educ. at Utrecht, graduating as Doctor andus (1916). His interest in the theory and practice of wireless dates from 1904. Came to England in 1916 to study under Professor J. A. Fleming. Proceeded to Cambridge in 1917, working under Professor Sir J. J. Thomson, at the Cavendish Laboratory for about eighteen months. Author of a number of monographs upon physical and radiotelegraphic subjects. Appointed Conservator and placed in charge of the physical research laboratory of Teyler's Institute, Haarlem Holland). He is one of the founders of the Dutch Radio Institute, of which society he is vice-president. In 1922 was appointed as physicist in the research laboratory of Philips Glowlamp Works (Eindhoven), where he is now in charge of the wireless research. Address: 4, Jan Smits - laan, Eindhoven, Holland.

Vanni, Dr. Giuseppe.—B. at Albano Laziale (Rome), in 1862. Graduated in science 1887. Proceeded to Strassburg University, 1890, where he studied electrical measurements under Prof. F. Kohlrausch. In 1894 he was appointed lecturer of Physics at the Collegio Romano, and in 1912 was elected professor and technical director at the Military Radiotelegraphic Institute in Rome. In 1912, took part in the International Conference of London, as a member of the Italian delegation, and also in the two Conferences of the Hour, held in Paris

in 1912 and 1913. His work has been principally concerned with optics, electrical engineering and wireless telegraphy. He made, in 1912, interesting experiments in wireless telephony between Rome and Treviso (420 Km.), and between Rome and Tripoli (1,000 Km.), thus obtaining, at the time, the record for wireless transmission. Is at present Director of the Military Radiotelegraphic Institute, and editor of the "Bollettino Radiotelegrafico del R. Esercito (Radiotelegraphic Army Bulletin), which aims at extending wireless research among the officers of the Italian Army. Address: Rome (49), Military Radiotelegraphic Institute, Viale Mazzini 10.

Vyryan, R. N.—Educ. Charterhouse. Elect. and Eng. training, Faraday House, 1896-1900. Assistant Engineer Whitehaven, Burton-on-Trent, Portsmouth and Hammersmith. Joined Marconi's Wireless Telegraph Co., 1900. Built Poldhu Wireless Station, subsequently proceeding to Canada as Managing Engineer until 1908. Built Spanish-American chain of stations. Appointed, in 1910, Superintending Engineer of Marconi's Wireless Telegraph Co. Responsible for design and construction of most of the high-power stations erected by the Marconi Co. Joined R.F.C. 1916, served in France. Later sent to America as member of the British War Mission. Demobilised and returned to Marconi Co. early in 1919 in charge of design construction and management of all wireless stations owned or erected by that company. Address: Royal Air Force Club, Royal Automobile Club, and Marconi House, Strand, W.C.2.

Weagant, Roy A.—B. Morrisburg, Ontario, Canada, 1881. Educ. Stanstead College, Stanstead, Quebec, and McGill University, Montreal. Graduated from Electrical Engineering Course, 1905. Studied Physics under Sir Ernest Rutherford and became interested in wireless. Gained engineering experience with the Montreal Light, Heat, and Power Company, the Westinghouse Electric Manufacturing Company of Pittsburg, Pa., and the De Laval Steam Turbine Company. Took up commercial wireless work in 1908. Entered service of the Marconi Wireless Telegraph Company of America, 1912, where he soon rose to the position of Chief Engineer. Appointed, 1920, Consulting Engineer, Radio Corporation of America. Member American Institute Electrical Engineers, Fellow of the Institute of Radio Engineers and former member of its Board of Directors and Standardisation Committee. Inventor of a novel method of eliminating static interference. Address: Douglas Manor, Long Island, New York.

Whiddington, Richard, M.A., D.Sc., F.Inst.P. B. 1885, in London. Educ. at St. John's College, Cambridge, where after taking degree in 1908, he undertook research work under Professor Sir J. J. Thomson. Elected Fellow of St. John's College, 1911. In 1914, went to Royal Aircraft Factory, Farnborough, to design wireless apparatus for the Flying Corps. During the war designed a number of the standard R.A.F. wireless sets and assisted on the W/T Board and Inter-Allied W/T Commission in Paris. Demobilised with rank of major, June, 1919. Has published a number of original papers on various electrical subjects. Member of Sub-Committee "D" on Thermionic Valves, of Radio Research Board, of the Department of Scientific and Industrial Research. Professor of Physics, University of Leeds. Address: Leeds University; and 36, Mow Road, Headingley, Leeds.

Whitmore, G. Scovell.—B. Dawlish, 1881. Educ. St. Andrew's College, Dublin. Served under Eastern Telegraph Company, Ltd., at Porthcurnow and Malta cable stations. Entered Heaton Works of Sir C. A. Parsons & Co., 1902, and became Chief Assistant to the Engr. and Gen. Manager of Northern Counties Electricity Supply Co., Ltd., in 1906. Joined the engineering staff of Marconi's Wireless Telegraph Co., Ltd. (1909), and appointed (1910) Managing Engr. at the Transatlantic W/T Station, Glace Bay, Canada. Since 1912 employed at the head office of Marconi's Wireless Telegraph Co., Ltd., mainly in connection with the construction and maintenance of high power W/T stations.

Wibier, Albert, Lieut.-Col. d'Etat Major.—B. Renaix, 1876. Sent, in 1911, by the King of the Belgians, to install the wireless network in the Belgian Congo. Became Director-General of that service, and for the construction of new wireless services. Organised and controlled the wireless service of the Belgian Army during the late war. President of the Wireless Commission of the Belgian Aero Club, Member of the Comité National Belge de l'Union Internationale de Radiotélégraphie Scientifique. Address: 11, Rue de la Reinette, Brussels, Belgium.

Wilson, Brig.-Gen. Sir Samuel Herbert, K.C.M.G., K.B.E., C.B., C.M.G.—B. 1873. Educ. privately and at R.M. Academy. Entered Army, R.E., 1893. Served S. Africa, 1899-1900. Served great war, 1914-18. Governor and Commander-in-Chief Trinidad and Tobago, 1921. From 1918 to 1921 Principal Assistant Secretary, Committee of Imperial Defence and Head of Imperial External and Defence Branch Cabinet Secretariat. Secretary Imperial Communications Committee; Wireless Telegraphy Committee; Officier Legion d'Honneur; French Croix de Guerre; Commandeur de la Couronne, Belgium; Belgian Croix de Guerre. Address: Government House, Trinidad, and Heath Cottage, Puttenham, Surrey.

Wilson, Ernest.—Educ. the Yorkshire College Leeds. Whitworth Scholarship. Apprenticed to Greenwood & Batley, and Siemens Bros. Professor of Electrical Engineering at King's College. Dean of the Faculty of Engineering, King's College. M.I.C.E., M.I.E.E., M. Wireless Soc., London. Fellow, of King's College. Contributed various papers read before Royal Society, I.E.E., Royal Society of Arts, etc. Holder of Kelvin Prize of the I.E.E. (1921). Addresses: University of London, King's College, W.C.2., and Savile Club.

Wilson, William Hamilton.—B. 1878. Educ. Collegiate School, Wanganui, New Zealand. Apprenticed to Cable & Co., Marine Engineers,

Wellington, N.Z. Electrical and mechanical courses at King's College, Strand, London, 1901 to 1904. Assistant Engineer Metropolitan Electrical Supply Co., Ltd., London, 1904 to 1906. Chief Assistant Electrical Engineer and Acting Electrical Engineer to East Indian Railway Co., Bengal, India, 1906 to 1908. Electrical Engineer to John Birch & Co., Ltd., London, 1910 to 1911. Secretary and Director of the Wilson Apparatus Co., Ltd., Carlisle, 1911 to 1913. In private practice since 1913 as electrical engineer and inventor. Inventor of various wireless telegraph apparatus, X-ray apparatus, and thermo-electric instruments. Designed some of the earliest transformers and apparatus used for army aircraft wireless, etc., before 1912. and transformers, wireless telegraph condensers and transmitting sets used in large numbers during the war. M.I.E.E., M. Rontgen Soc. Joint author of various papers in "The Electrician" on "Measurement of Self Induction, High Tension Discharge Apparatus," etc. Author of paper before Royal Society on "Ruhmkorff Coils," Address: 5-6 Bank Broadway, Kingston Hill, Surrey.

Yokoyama, Eitaro.—B. 1883. Graduated Engineering College of the Tokyo Imperial University, 1908. Entered Ministry of Communications, Japan. Engaged in radio researches at the Electro-technical Laboratory of the Ministry. One of the inventors of T.Y.K. Oscillation Gaps for Radiotelephony. Proceeded to America and Europe to study, 1916. Returned to Japan, 1918, and resumed service at the same Laboratory. Promoted to the Head of the Radio Section of the Laboratory, 1920. M.I.R.E. (America). I.E.E. (Japan). Inst. of Japanese Telephone and Telegraph Engineers. Private Address: Kiharayama 1523, Omori, Tokyo.

Zenneck, Professor, Dr. J.—B. 1871, in Württemberg. Studied at Tübingen. Obtained his doctorate, 1894. Studied natural history in London and elsewhere. Subsequently devoted himself entirely to physics. Assistant in the Physical Institute in Strassburg, 1895-99. Engaged in making tests with wireless telegraphy in the North Sea, 1899-1900. Assistant Professor of Physics in the Institute of Technology, Dantzic, 1905. Professor of Physics at the Institute of Technology, Brunswick, 1906. Professor of Physics at the Institute of Technology, Dantzic, 1911, Munich, 1913. During part of the war Technical Adviser to the Atlantic Communication Co., which then operated Sayville wireless station. Member of Bavarian Academy of Sciences. Fellow of the Institute of Radio Engineers. Address: Technische Hochschule, München (Germany).

OBITUARY.

Among those whom death has claimed since the last edition of the YEAR-BOOK went to press are three whose names are prominently associated with the development of wireless.

* * * * *

M. EMILE FREY, who died at Arlesheim, at the age of 84, was director of the International Bureau of the Telegraph Union, from 1899 to 1921. Born at Arlesheim, near Basel, he visited America at the time of the American Civil War, and joining the Northern (or Federal) Army served from 1861 till 1865. In 1865 he returned to Switzerland and was elected to various state offices, becoming a member of the National Council in 1872, of which he was chairman from 1875 to 1876. In 1894 he became President of the Swiss Confederation, and resigned from the Federal Council in 1897, becoming Director of the International Bureau in the same year, and of the Radio-Telegraphic Union in 1910.

SIR JOHN GAVEY, who was for several years consulting engineer to the Post Office, and who was closely concerned with the installation of the first wireless telephone in this country, died on January 1st, 1923, at the age of 80 years.

Dr. UICHI TORIGATA, an eminent Japanese engineer, died in July, 1923. Born in Japan in 1883 he early devoted himself to the study of wireless telegraphy and telephony and became eventually Director of the Electro-technical Laboratory of the Japanese Department of Communications.

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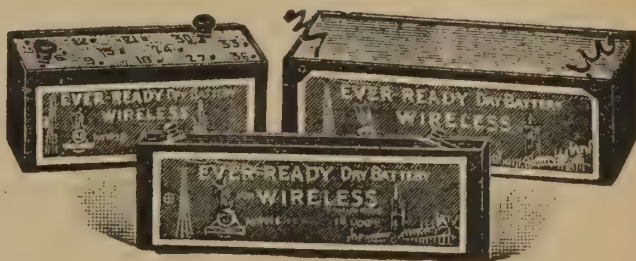
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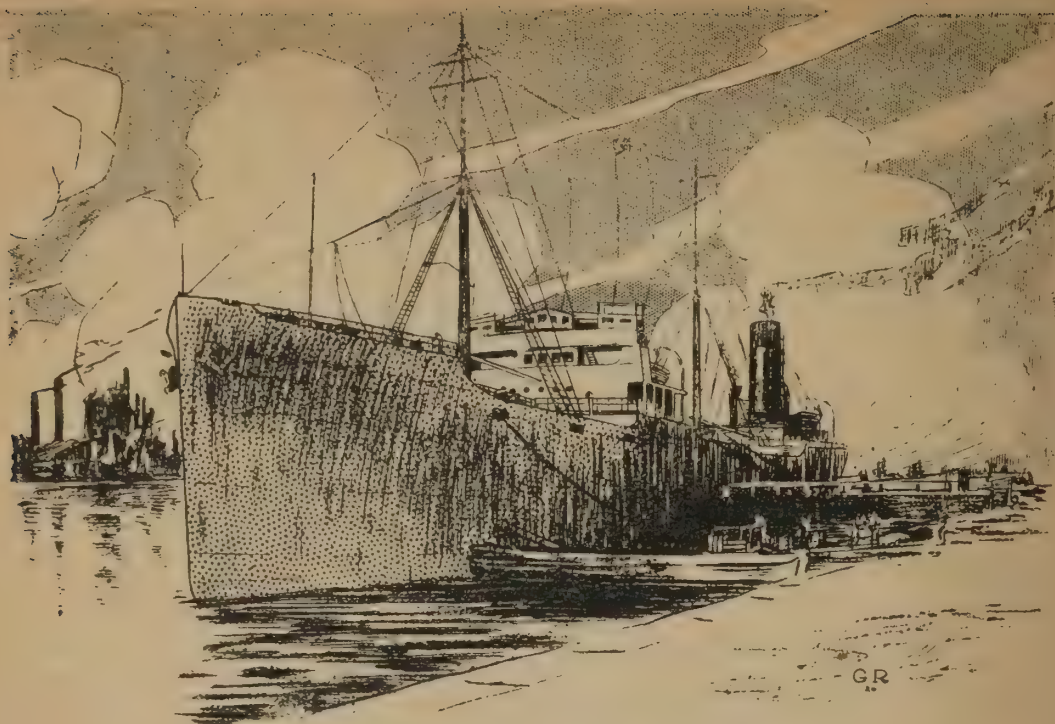
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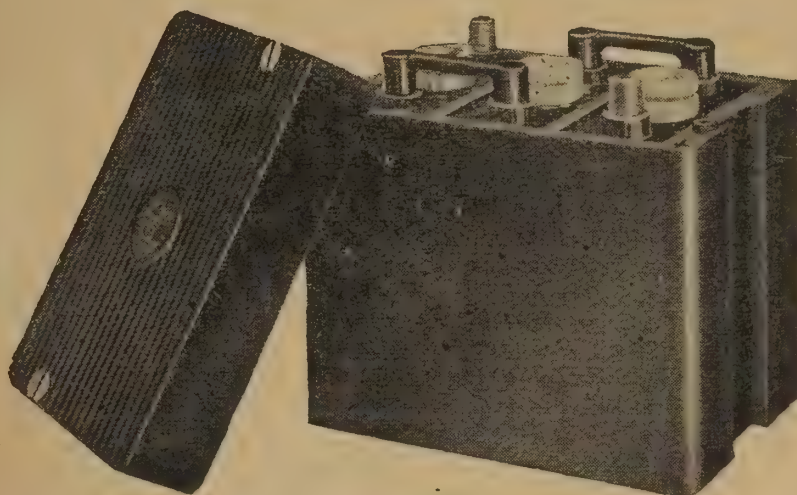
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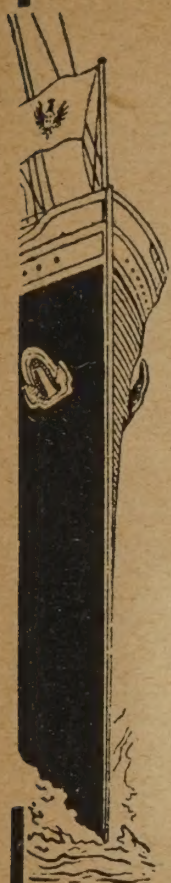


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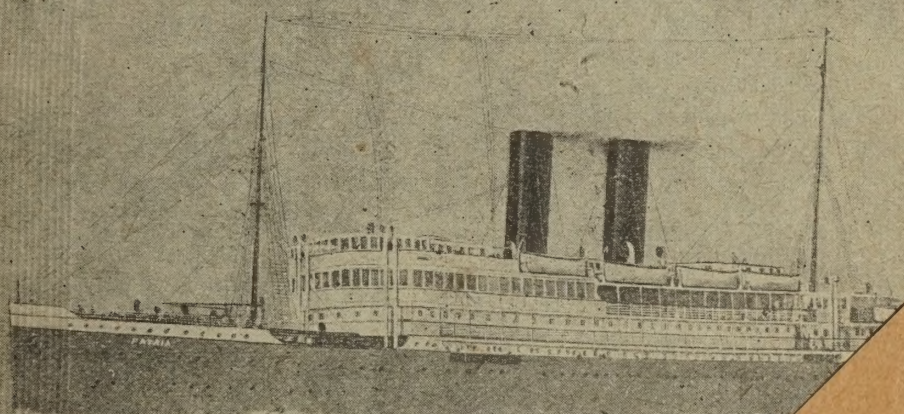


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